BUREAU OF HYGIENE AND TROPICAL DISEASES.

TROPICAL DISEASES BULLETIN.

Vol. 31.] 1934. [No. 5.

BERIBERI AND EPIDEMIC DROPSY.

A Review of Recent Literature.

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(Received March 14, 1934)

The last review of this subject (P. W. Bassett-Smith) appeared in this journal in 1921. The present survey, based for the most part upon papers summarized in the *Tropical Diseases Bulletin*, covers the period 1921–1933. In addition to the large amount of recent research upon beriberi the difficulty of presenting a general account of the subject in a small space is increased by the inclusion of epidemic dropsy in the discussion. This latter condition has recently received so much attention that no review would be complete without a consideration of its relationship to the beriberi syndrome.

Rice-eating peoples are prone to suffer from a condition of oedema which is frequently epidemic and not connected with the usual cardio-renal causes. As pointed out by Megaw[1] the condition in one extreme presents the syndrome of epidemic dropsy (fever, rash, gastro-intestinal symptoms, capillary dilatation, glaucoma, etc.) and at the other extreme the picture of chronic beriberi with peripheral neuritis. While admitting that in the intermediate stages the two conditions may overlap and closely resemble one another, there can be little doubt that at either extreme beriberi and epidemic dropsy are distinct and separate clinical entities, and as such they will be regarded in this review.

Beriberi.

Etiology.—Evidence is still collecting confirming the view that beriberi is a vitamin B deficiency disease associated with the over-milling of rice. Thus, Cazanove[2] has shown that in Cochin-China the beriberi hospital admissions in 1916 were 988 with 197 deaths, while in 1928 there were 3,425 admissions with 600 deaths. It is claimed that this increase is due to prosperity in the western provinces causing the natives to substitute polished rice for the coarser variety. Fukushima[3] reports that beriberi incidence in the Japanese navy in 1912 was 1 per 1,000, while in 1919–1921 the figure rose to over 4.

This was apparently due to an increase in the white rice ration which was later again reduced with beneficial results. LICHTENSTEIN[4] states that in 1918 the issue of unpolished rice to the Dutch East Indian army was stopped, with the result that the beriberi incidence rose from 1·8 per 1,000 in 1918 to 26 per 1,000 in the first eight months of 1922. According to ALBERT & OCAMPO[5] the infantile beriberi hospital admission rate in Manila fell from 7·79 per cent. in 1915 to 0·45 per cent. in 1927, and this improvement is due to the issue of Tikitiki extract (made from the pericarpal layer of rice grain) on a large scale to the poorer classes. The recommendations of the Far Eastern Association of Tropical Medicine congresses in 1923 and 1925 clearly support the vitamin deficiency theory. Such examples can be multiplied, together with suggestions for the public control of a standard rice issue (VEDDER & FELICIANO[6] and others).

On the other hand, MCCARRISON[7], whose large experience must command full consideration, is not satisfied that vitamin deficiency is the sole agent in the causation of beriberi. He points out that though rice-eating races are widely distributed throughout India endemic beriberi is confined to certain well-defined and narrow areas, especially in Madras, and has been so for the last hundred years. Strict rice-eating Hindus in these areas suffer less than those classes which do not restrict themselves to rice. Millet-eaters here, too, suffer from beriberi, but not elsewhere. The disease originates only in those jails which are situated in the endemic area, though the diet is the same throughout all the Madras jails. From such considerations he holds the view that two factors are in operation in the causation of beriberi: (i) a nutritional, or intrinsic, factor, and (ii) an unknown extrinsic factor peculiar to certain tracts of country or to certain individuals. As regards the first factor he finds that it is rice relatively less deficient rather than relatively more deficient in vitamin B which is responsible for the human disease. GRAHAM[8], dealing with McCarrison's work, develops this view. He states that supposing the figure 100 represents the amount of vitamin B necessary to keep pigeons in health on any given diet, then true beriberi will occur at figures 75–90, while a figure of 50, or lower, will cause polyneuritis columbarum. Thus, true beriberi is due to insufficiency rather than complete absence of the necessary factor.

Some confusion seems to have arisen regarding how far one is justified in quoting animal experiments in support of beriberi etiological views. Very large numbers of such experiments have been conducted, but the work of MCCARRISON and GRAHAM appears to clarify the position. Polyneuritis columbarum and true beriberi in pigeons are two distinct conditions. In the former the heart is atrophied, while in the latter cardiac hypertrophy and degeneration are present. The condition of the heart is considered to be the essential distinguishing feature. It may be added that various endocrine changes have been recorded in avian beriberi (KORENCHEVSKY[9] and others).

The extrinsic toxic factor postulated by MCCARRISON is of metabolic rather than microbial origin, but a considerable amount of research has been carried out on the possible association of a micro-organism with beriberi. In this connexion the work of BERNARD[10] must receive attention. This worker claims that beriberi is an acute febrile illness and that peripheral neuritis, with or without oedema, only occurs later in the cases that survive. The chronic picture of the disease, he thinks, is too often regarded as that of true beriberi by

those who identify experimental B-avitaminosis with the human condition ; in other words, what is usually regarded as beriberi is only a sequel of a previously contracted toxi-infection. Bernard has isolated an organism, *B. asthenogenes*, which he claims is an etiological factor of importance. Animal experiments, complement fixation tests, etc., support this view, but two additional etiological factors are demanded, viz., a gastro-intestinal condition favouring the action of the organism and a lowered resistance resulting from faulty diet. If one of these factors is absent, even though the other two are present, beriberi does not result. Pons and Borel[11] confirm the presence of positive complement fixation tests with *B. asthenogenes* in human sufferers. Cannon[12] supports Bernard's views as regards toxi-infection and faulty diet, but he includes another factor—endocrine disturbance.

In 1929 Matsumura[13] described a " beriberi bacillus " resembling *B. coli communior*. This bacillus was isolated from the intestines in experimental animals and from the faeces in 74 per cent. of human sufferers. Positive agglutination tests were obtained. From these results it is claimed that the bacillus is the principal etiological factor in experimental beriberi. Parreiras[14] and de Araujo[15], both working in Brazil, are opposed to the view that Matsumura's bacillus is a specific organism for beriberi, while Pavy[16] supports the contention.

The possibility of there being a toxin in rice itself has received little consideration. Ohmori[17] attempted to prove that cold alcoholic extracts of rice contain a toxic substance, while Acton and Chopra[18,19] have shown that damaged grain may be classified as " epidemic dropsy rice " and " beriberi rice " according to whether water-soluble toxins or alcohol-soluble toxins predominate.

To sum up this section it may be stated that the consensus of opinion is that beriberi is associated with vitamin B deficiency, but that another factor, probably of a toxic nature, is also present.

Pathology.—The view expressed by Shattuck[20] that it is not possible either in the laboratory or at autopsy to demonstrate a conclusive criterion of beriberi may once have been true, but the cardiac findings in typical cases may be regarded as diagnostic. These will be referred to later. Tull[21] reports that thickening of the wall of the gall bladder is a constant feature in beriberi.

Important in this section is a consideration of the mechanism of symptom-production in beriberi. The water-retention theory was first put forward in 1928 by Mebius [22,23] and Wenckebach[24]. They showed that oedema occurs in the heart muscle, chiefly intracellular in site and affecting the anisotropic substance of the muscle fibre. Excess of water interferes with the normal fluid exchange and consequently with contractility. The control of osmotic presssure depends upon the presence of vitamin B, and all the other symptoms of beriberi can be explained by water retention. de Langen[25] considers that disturbance of lipoid metabolism is responsible for the symptoms of the disease. Findlay[26], too, suggests that vitamin B is an essential factor in the synthesis of animal nucleic acid by the body. On the other hand, Walshe[59] disagrees with this view because there is no proof that chromatolysis indicates nuclear starvation or that it causes paralysis. Without doubt, water-retention in beriberi is of the greatest importance in elucidating the mechanism of symptom production.

Clinical.—It can safely be assumed that in countries where beriberi is endemic for every actual sufferer from the disease there must be

many more who are constantly living upon the brink of nutritional trouble. Such a pre-beriberi state has not received, as yet, all the consideration it deserves. In a most interesting paper GREY[28] points out that in deficiency diseases there is not only the question of the accessory factor but also of the factor to which it is accessory. In Japan the diet is unbalanced, being low in protein value and high in starch content, but the amount of vitamin B may be sufficient for ordinary conditions. With the advent, however, of such adverse conditions as excessive heat or humidity, lack of exercise, fatigue or intoxications beriberi may develop without any change of diet. During July, August and September in Japan a state of malnutrition passes abruptly into one of beriberi. Thus, in the Central Telephone Exchange, Tokyo, visited by Grey in June 1927, out of 500 female employees 80 were incapacitated from work by a condition which was regarded as beriberi or about to be beriberi. Showing how widely spread deficiency disease is in Japan the following report is of interest : out of 207,939 sick in the Japanese army in 1923, 82,429 were found to be suffering from nutritional disorders. Grey is also of the opinion that mouth-breathing, defective eyesight and the common habit among Japanese of preferring to sit at work and falling asleep in public conveyances are all symptoms of under-nourishment. THIERFELDER-THILLOT[27] has observed that the more chronic cases of beriberi develop among those who have experienced partial vitamin deprivation for some time, while the acute malignant cases are found where there is a sudden change from a normally balanced diet to vitamin deficiency. In 1928 BRAY[29] reported that a large part of the high infantile mortality in the island of Nauru, a mandated territory in the Pacific, is due to vitamin B deficiency, and that saturation of babies with the necessary vitamin brought about recovery from gastro-enteritic, pneumonic and meningismic symptoms in a few hours. COWGILL[30] from experiments on dogs has clearly shown that deprivation of vitamin B causes loss of appetite, and he quotes the work of MORGAN and BARRY to show that shortage of this factor may bring about restriction of growth in American school children.

Considerations of the condition known as infantile beriberi have been prominent in recent literature. The importance of the subject can be realized from the fact that in the Philippines 16,500 deaths occur annually from this cause (about 28 per cent. of total deaths among infants under one year). Most of the cases occur in breast-fed infants, but exceptions are recorded. Most observers maintain that the mothers of such infants are themselves sufferers from beriberi, but according to ALBERT[31] in 25 per cent. of cases no symptoms nor signs of the disease can be found in the mother. Clinically, the picture resembles the adult type with oedema and cardiac failure but apparently neuritis (except for that of the laryngeal nerves, causing aphonia) is usually absent. Nevertheless, Albert is emphatic in his belief that infantile beriberi is not the adult form in miniature, but a distinct entity. The remarkable effect of tikitiki extract in lessening the mortality rate is referred to elsewhere.

The most important advances in the clinical study of beriberi are undoubtedly those dealing with cardiology. In 1928 WENCKEBACH[24] gave a full description of the heart in beriberi ; from the onset of the disease the right side of the heart is enlarged, and the same is true of the left side but to a less extent. There follows a rapid increase in the size of the heart, chiefly of the right side, with cardiac failure. This is

confirmed radiologically and also clinically by a peculiar "wriggling fluttering" of the apex beat. Increasing stasis leads to hepatic enlargement, engorgement of the venae cavae, ascites, and even sudden death. There is never any disturbance in the fundamental cardiac rhythm, and electrocardiograms reveal only slight right ventricle preponderance. The pulmonary circulation shows no stasis. For treatment the ordinary cardiac tonics are useless and administration of vitamin B is the only remedy. At autopsy there are no signs of inflammatory change in the myocardium, and the cause of the condition as already mentioned, is a failure of muscular contractility due to water-retention.

The most serious complication of beriberi is sudden heart failure, called by the Japanese shôshin. This also has received very full consideration from WENCKEBACH[32]. The condition is especially liable to occur in young subjects who are apparently well and able to walk about, and thus peripheral neuritis with its obligatory inactivity is a safeguard in this respect. The onset is sudden with acute distress and severe pain in the chest and upper abdomen. Sudden death is likely to occur. A clear post-mortem picture of the condition was obtained by injecting bodies with formalin immediately after death. Enormous enlargement of the right heart with great engorgement of the large veins and liver are constant features. In one of WENCKEBACH's cases so great was the distension of the right auricle that the blood could be seen through the stretched wall. The right ventricle is found to form practically the whole of the heart when viewed anteriorly, and the right conus arteriosus is markedly curved forwards (pathognomonic of the condition).

In 1931 AALSMEER[33] described what is now known as the "adrenalin effect," viz., a marked fall in diastolic blood pressure (practically to zero) after the injection of adrenalin in beriberi patients. This fact is a useful diagnostic criterion, and can be used as a guide in assessing the value of any particular form of treatment. In this respect beriberi resembles aortic regurgitation and exophthalmic goitre. Recently, AALSMEER[34] has pointed out that the adrenalin effect as a test for the continued activity of beriberi may fail owing to decompensation of the left heart. Administration of cardiazol shortly before the adrenalin injection acts as a stimulant to the left heart, and the full adrenalin effect will then be obtained.

Treatment and Prophylaxis.—Assuming that the eating of polished rice is a factor of the greatest importance in the causation of beriberi one would naturally think that the disease could be quickly and easily stamped out by simply supplementing the diet with vitamin-rich food or by consuming only unpolished rice. Unfortunately the customs and tastes of human beings cannot be changed by legislation. Thus, many years ago unpolished rice was issued to the army in the Dutch East Indies as a prophylactic measure, but in 1918 this had to be stopped because the native soldiers refused to eat it. EIJKMAN[35] truly points out that everywhere the difficulty is recognized of supplying a sufficient quantity of vitamins in a palatable form to a rice-eating population if only polished rice is available. The claim of JANSEN and DONATH in 1926 that they had isolated pure vitamin B from rice bran should be of the greatest importance in this respect. They found that 1 part of this substance in 500,000 parts of washed polished rice protects *Munia maja* (a finch) against polyneuritis. COHEN & AZIR[36] have treated

beriberi patients with this product and striking results were obtained. In shôshin the effect was regarded as life-saving.

The excellent results obtained in the Philippines from the administration of tikitiki extract have already been mentioned. This preparation is an alcoholic extract made from the pericarpal layer of rice grain and it is issued by the Public Welfare Board in large amounts. According to BELMONTE[37] the dosage is as follows: to mothers, in addition to a balanced diet, a tablespoonful of the extract is given after meals; for babies 3–4 teaspoonsful a day are sufficient in mild cases, but in severe cases 5–7 teaspoonsful a day are necessary. In the Dutch East Indies DE VOGEL[38] has described similar work. There the Public Health Authorities issue rice husk vitamin in four forms:— (1) *tablets*, each containing 7·5 gm. of rice husk absorbed by kaolin; 1–3 tablets a day protect an adult, eating completely decorticated rice, while for treatment 8–12 tablets are necessary. (2) *Extract of anti-beriberi vitamin*. A daily dose of 1–10 cc. is sufficient for adult protection. (3) *A powder*—similar to the tablets. (4) *Ampoules* (2 cc.). Each of these contains 1 mgm. of vitamin which is the daily adult dose. Later, VAN VEEN[39] found that the above doses had to be increased somewhat, and he points out that toxic effects may sometimes follow the injections. Satisfactory results have also been obtained from the use of various oryzanin preparations and from Wenckebach's "eviunis." In short, a consideration of recent literature reveals the fact that the prophylaxis and treatment of beriberi is largely a matter of dietary supplements in one form or another.

As might be expected, various drugs have been tried and in a paper by TOURNIER[40] a very formidable list of these will be found. PAVY[16] claims that urotropin is a specific in beriberi. He states that with a dose of 7½ grains 4 times a day cure can be expected in 15–21 days. AALSMEER[41] has obtained good results with Lugol's iodine solution when a vitamin-rich diet has failed. The similarity between the adrenalin effect in Basedow's disease and beriberi suggests the presence of thyroid dysfunction also in the latter. In the treatment of sudden heart failure, as has been already pointed out, the usual cardiac tonics fail, and adrenalin is definitely harmful since it causes a marked drop in diastolic blood pressure (already low in beriberi) and an increase in the venous pressure. According to WENCKEBACH[32] pitressin raises the diastolic blood pressure in beriberi from almost zero to 75–90 mm. and the venous pressure suddenly falls. This beneficial effect may last from 25 minutes to 1¾ hours. On the other hand, AALSMEER[42] finds that pitressin is not always successful in cases of shôshin, because the relief of the right heart may throw a sudden burden on the left heart which it is not able to bear. He quotes one case where death occurred immediately after a pitressin injection. Venesection must not be forgotten as a valuable aid in the relief of cardiac failure in beriberi.

Epidemic Dropsy.

The greater part of the research work on this condition, which has only recently received much attention, comes from India. The history of the disease in Calcutta reveals some interesting epidemiological features. According to MAZUMDAR[43] epidemic dropsy first appeared in Calcutta in 1877 and two following years. With the exception of a small outbreak in 1901, no further cases were reported until 1907 when an epidemic, on this one occasion associated with peripheral neuritis, occurred. In 1909 the number of deaths from this

cause was 433 (Hindus 336, Mahomedans 77). The epidemic of 1919 was responsible for 96 deaths, the mortality being three times greater among Hindus than Mahomedans, and four times greater in females. In the epidemics of 1926 and 1927 there were 939 and 630 fatal cases respectively. In 1930 there were 68 deaths and in 1931, 52.

As regards the etiology of epidemic dropsy there seems to be fairly general agreement that rice when faultily stored, especially when exposed to excessive heat and moisture, develops toxic properties. A good example of the way in which this may occur is recorded by SARKAR and GUPTA[44]. One day a boatload of rice arrived at a certain populous village in the Noakhali district. The rice was distributed to various people and no cases of epidemic dropsy occurred except in the household of a certain Dr. Nath. This family stored its rice in a dol besmeared with cow dung on the outside and kept in a damp room. After about seven months, when the last portion of the rice at the bottom of the dol was being consumed, the whole family, including the doctor himself, developed the disease. The same rice stored in earthen vessels previously soaked in mustard oil and also the remainder of the rice bought by other people was harmless. It appears, therefore, that in the grain, owing to long storage in damp conditions, a saprophytic organism had become pathogenic. MEGAW & BANERJI[45] described two similar family outbreaks in which the severity of the disease was proportional to the amount of rice eaten and in which recovery followed abstention from it. Similarly MEGAW & BHATTACHARJEE[46], in investigating an outbreak consisting of 70 cases in a small quarter of Calcutta, found that the only factor common to all was parboiled rice which had been stored for about one year. On the other hand, a study of an outbreak in Allahabad (BANERJI[47]) revealed the following etiological facts. The disease was practically confined to Bengalese, while Mahomedans entirely escaped. The Bengalese live on rice, fish, vegetables cooked in mustard oil, fresh fruits, etc., but they have been accustomed for generations to carbohydrate excess which is not true of the Mahomedans. It is suggested that this may account for the remarkable difference in vulnerability of the two races. It was also reported in this epidemic that several members of a family were affected one after another even when rice had been prohibited, and there were three families attacked in which no rice at all had been eaten for a month previously. GHOSH[52] who investigated the same epidemic states, however, that those Bengalese who ceased to take rice, or changed to the local hand-milled variety, escaped and that the brunt of the epidemic fell upon those who bought their rice from one particular market.

DUTT[49], basing his views upon 1,700 cases, is convinced that the food-toxin theory of etiology is false. He is of the opinion that the disease is a manifestation of intestinal sepsis depending upon the presence of a specific micro-organism. He gives three reasons in support of this view : (1) throughout the disease there is a leucocytosis which lessens during convalescence and disappears with complete cure. (2) A doctor infected himself while operating upon an epidemic dropsy patient (Col. MEGAW, however, suffered no ill effects after inoculating himself with 3 cc. of serum from another patient). (3) The disease is immediately checked and ultimately cured by a powerful antiseptic, such as colloidal gold in the presence of nascent chlorine.

In 1927, cases of epidemic dropsy began to occur among Indians in Fiji (SAGAYAM[50]). The rice consumed by them was imported but it

was shared by Fijians and Chinese none of whom contracted the disease. It was supposed, therefore, that mustard oil was responsible. Both BANERJEE[51] and GHOSH[48], investigating an epidemic in Bengal, came to the same conclusion. BOSE[53] opposes this view because the disease broke out in a jail in Upper Burma where no mustard oil was used, and also because in Calcutta the Makwaris who never take mustard oil are among the sufferers. More recent opinion seems to be that mustard oil has nothing whatever to do with the causation of epidemic dropsy. The same is true of vitamin deficiency. One more etiological fact may be mentioned, viz., no infantile form of the disease is described. To sum up this section, it may be stated with some confidence that epidemic dropsy, unlike beriberi, is not associated with vitamin deficiency but rather with some unknown toxic factor found among rice-eating peoples and possibly having its origin in grain which has been stored under unsatisfactory conditions.

The post-mortem findings in epidemic dropsy are most interesting. DE[54] describes extensive vascular dilatation in the deep layers of the skin just where the adipose tissue begins. This is regarded as a characteristic feature of the disease. The heart muscle shows no degenerative changes but the muscle fibres are separated by dilated capillaries. Similar capillary dilatation is present in the ciliary body of the eye, leading to excessive production of fluid in the anterior chamber. The tongue, oesophagus, stomach and small intestines reveal no abnormality, but in the large intestines enormous dilatation of blood vessels is encountered. SHANKS[55] finds telangiectatic capillary dilatation not only in the subcutaneous tissues but also beneath the pericardium and peritoneum, and in the lungs, endometrium and ovaries. In short, the dilatation appears to occur wherever the vessels are least supported. There is no surrounding inflammatory reaction and but little tendency to haemorrhage.

Clinically the disease begins with fever, vomiting, diarrhoea and oedema. The average duration of the condition is six weeks. Peripheral neuritis, except in one outbreak in Calcutta, is notably absent. In those cases showing absence of knee jerks the phenomenon is entirely due to the mechanical effect of the oedema (there is no anaesthesia and no tenderness of the muscles). According to CHOPRA & BASU[56] the cardiac condition is as follows :—In early cases there is tachycardia with muffling or reduplication of the mitral first sound. Later, murmurs of relative incompetence are heard at the apex and these are due to dilatation of the left ventricle. The right side of the heart usually shows no enlargement and congestive cardiac failure is rather rarely encountered. Cyanosis and jugular pulsation are notably absent and electrocardiograms show only sinus arrhythmia. On the other hand, SHAHA[57] reports that cardiac failure of the congestive type is common.

On the skin roseolar and petechial eruptions are frequently met with, and in addition Shaha describes another condition sometimes observed : " here and there, one finds red dots, varying from the size of a split pea to as big as a small grape, made up of blood vessels in the form of warts . . . they are sometimes sessile, but may be pedunculated ; sometimes they bleed. They occur mostly on the lower limbs, but may occur on the trunk, both front and back, and rarely on the abdomen." SAGAYAM[50] in Fiji described a similar condition, only in his cases the capillary naevi bled profusely. GUPTA[58] reporting upon the 4th and 5th Calcutta epidemics stated that haemorrhages occurred from almost every orifice. Glaucoma is a late symptom.

Treatment consists largely in giving a liberal protein diet and substituting wheat bread for rice. Tincture of ephedra was found to be a valuable remedy by CHOPRA & BASU[56], and thyroid extract may be helpful. Opinion as to the value of the usual cardiac tonics appears to be divided. For the rest, treatment is symptomatic.

In conclusion, it may be stated that epidemic dropsy with its fever, gastro-intestinal symptoms, rash, telangiectases and glaucoma and in its freedom from neuritis, sudden cardiac failure and the absence of an infantile form is a clearly defined clinical entity, little resembling beriberi. *A. Douglas Bigland.*

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PLAGUE.

McMullen. Etudes sur la peste à Hawai. [**Plague in Hawaii.**]—*Bull. Office Internat. d'Hyg. Publique.* 1933. Nov. Vol. 25. No. 11. pp. 1931–1932.

The common flea of Hawaii is *Xenopsylla cheopis*. A new species of flea, *X. awaiiensis*, has been found and may be a factor in the transmission of plague. Plague has been endemic for 25 years on the north-east coast of the island of Hawaii, which is the largest island of the group and there have been about 135 human cases during this period of time. A second focus of plague was recognized in 1931 in the island of Maui.

W. F. Harvey.

Pardal (Eduardo). La peste en Pampita (Prov. de San Luis). [**Plague in Pampita.**]—*Rev. Inst. Bacteriológ.* Buenos Aires. 1933. Nov. Vol. 6. No. 1. pp. 18–28. With 1 map. English summary (9 lines).

An account is given of the first appearance of plague in the province of San Luis, Argentina, in 1916 and its recurrence at long intervals up to the present time. A map, in which the dates of plague occurrence are attached to the towns, serves to illustrate the paper. The disease is shown to have followed the course of an important road starting from the capital, San Luis, and proceeding north to Pampita. In the present manifestation of plague as well as in the previous ones there has been an epizootic among rats coexistent with the human plague wherever it has happened. *W. F. H.*

Wassilieff (A.). Les rongeurs et puces de Tunisie et leur rôle dans la propagation de la peste. IV.—La receptivité comparée des divers rongeurs tunisiens vis à vis de la peste. [**Rôle of Rodents and Fleas in the Propagation of Plague. Susceptibility of the Tunisian Rodents.**]—*Arch. Inst. Pasteur de Tunis.* 1933. Nov. Vol. 22. No. 3. pp. 443–475. With 2 figs. [18 refs.]

An argument runs through the whole of this work regarding the preservation of the plague virus in fleas for long periods of time and the danger of establishing a flea plague reservoir in the interior of Tunis. The author discounts the importance of the commonly accepted sequence of rat, flea, man.

Plague may be introduced through the agency of man and not the rat. Such epidemics as have arisen in rural Tunis have been of human origin. Fortunately no permanent reservoir of plague exists at the present time. The danger exists, however, of its establishment and especially of its arrival from over the Tripolitan frontier. Most of the article is taken up with the points of the argument and with a forecast of what may happen in the future. Some interesting experiments are given which show that merion rodents (*Meriones shawi*) are unusually resistant to infection by plague bacilli, whether by cutaneous or sub-cutaneous inoculation. In this respect they differ completely from the guineapig, from rodents such as *Psammonys roudairei* and *Dipodillus dodsoni*, and from other rodents also. The most susceptible of the wild rodents of Tunisia are *Psammonys roudairei, Dipodillus campestris, Dipodillus dodsoni, Jaculus orientalis, Mus barbarus* ; a little less susceptible are *Gerbillus hirtipes, Mus musculus azoricus* and *Mus musculus*

gentilis. Least sensitive is *Meriones shawi*. The rodent distribution of the country is regionally distinct. From the extreme north (Bizerta, Tunis) to Foum Tatahouine the rat population consists chiefly of *Meriones shawi* and to still further south of *Psammonys roudairei*.

W. F. H.

VAN LOGHEM (J. J.). Naar aanleiding van vijf en twintig jaar Rattenonderzoek. [**Twenty-five Years of Rat Research.**]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1933. Dec. 5. Vol. 73. No. 25. pp. 1581–1590. [Refs. in footnotes.]

General observations on the opinions held regarding the agency of rats in the propagation of plague form the subject matter of this article.

The paragraphs under which the subject is treated are : (1) the sewer rat in the Netherland Indies, (2) morphological and biological differentiation of the field rat, (3) continuous and metastatic spread of plague, (4) active migration of rats, (5) exclusiveness of the rat family, and (6) nomenclature. It is interesting to learn how through a quarter of a century opinion gradually crystallized to that which is now held. At first, for example, it was thought that *Rattus norvegicus* did not occur at all in the Netherland Indies. This idea prevailed even up to 1911. Whether the sewer rat is gradually ousting the house rat receives consideration and it is thought that this has begun to take place in Java. The terms continuous and metastatic propagation of plague refer to transmission by contact and to a distance respectively, which, so far as plague rats are concerned, reduces to the distances at which house rats are met with from their human habitations Under exceptional conditions such excursions have been noted but not as a general rule.

W. F. H.

EGOROV (A.). **The Rôle of Raptorial Birds in the Epidemiology of Plague.**—*Rev. Microbiol., Epidémiol. et Parasit.* 1933. Vol. 12 No. 2. pp. 133–134. [In Russian. English summary p. 134.]

It is known that in raptorial birds—such as eagles, hawks, owls, etc. —the undigested parts of their prey are rejected through the mouth in the form of " casts." These contain the fur, bones, fragments of cartilage and tendons, and sometimes even tails and limbs, all rolled up into a bundle measuring 1–3½ inches in length and 1–1½ inches in breadth. The peripheral part of the " cast " usually contains the hair, while the centre is occupied by the other elements, the whole being soaked in the juice from the gizzard. If infected rodents are eaten by raptorial birds it is conceivable that they might disseminate plague through the medium of the " casts," provided *Past. pestis* retains its viability.

To test this the following experiments were conducted. A captive eagle, *Aquila hipalensis*, was fed on infected guineapigs and on normal rodents. The " casts " (regurgitated 2 days after the meal) were found to contain viable plague bacilli, as shown by growth in cultures and successful inoculation of rodents. Moreover, the bacilli which originated from the infected food-animal contaminated the " casts " derived from the normal animals fed to the eagle, the remains of which could be recognized by the colour of the fur. These preliminary experiments suggest the importance of studying the rôle of raptorial birds in the epidemiology of plague.

C. A. Hoare.

IIMURA (Yasuzo). Observations et commentaires sur les mesures préventives contre la peste (résumé). [**Notes on Plague Prevention.**]—*Bull. Office Internat. d'Hyg. Publique.* 1933. Nov. Vol. 25. No. 11. pp. 1943–1951.

It was the task of the author to review the period from the time when plague first made its appearance in Japan in 1899 onwards to the present day. He makes his commentary on defensive measures against foreign rats, against fleas and on other preventive measures. Some of these carry the lesson of a comparatively useless expenditure of time and money for the results achieved and have a special interest for others on this account.

In the period under consideration 8 cases of plague were discovered in a port of quarantine. The result, again, of fumigation of ships was a destruction in 1926 and 1927 of 4·8 rats per ship in quarantine stations. Such a mediocre figure is scarcely commensurate with the discomfort imposed upon passengers. It is a little better in New York at 9·6 per ship. No one disputes the prime necessity of an active campaign against rats as an antiplague measure. And yet some of the measures taken are not economical. An organized corps of rat catchers generally obtains more indifferent results than if prizes are offered for the capture of rats. In the former case each rat caught cost 2 yen, which is too expensive.

A thorough cleansing of a plague proscribed house is one method of deratization. During the period 1914 to 1917 a total of 44,353 houses received such treatment in four large towns and this furnished 3,284 rats or only 0·6 per house. During that same period the method of offering prizes resulted in the taking of 992,653 rats at the moderate cost of 54,153 yen. Various measures have been directed against fleas. Cresol emulsion, carbon tetrachloride and naphthalene are flea poisons, but they have little penetrative power. Sulphuretted hydrogen is an excellent pulicide, and will kill fleas in 14 to 52 seconds in 1 per cent. concentration. It has the disadvantage of attacking metallic substances. Finally the subject of preventive vaccination and the use of an immune serum receive a brief mention. *W. F. H.*

GAUD (M.); JORGE (Ricardo). Sur l'importance du bubon sous-pectoral dans le diagnostic et l'évolution de la peste. [**The Importance of the Subpectoral Bubo in the Diagnosis and Course of Plague.**]—*Bull. Office Internat. d'Hyg. Publique.* 1933. Nov. Vol. 25. No. 11. pp. 1924–1927. With 2 figs. on 1 plate; 1928–1930.

Both communications deal with the value of the exact position of the axillary bubo as being almost specific for plague and as accounting for secondary plague pneumonia.

The axillary lymph nodes are the crossing place for the lymphatics of the upper limb, shoulder, back and a large part of chest and abdomen. They are divisible anatomically into 5 groups, of which the specific plague group is essentially the thoracic. It is seldom that this group is affected by the lesser septic infections in the way that the brachial group is. There are the upper thoracic lymph nodes in front of the external mammary artery under the tendon of the pectoralis major at the level of the 2nd and 3rd inter-costal spaces and the lower thoracic nodes situated along the artery at the level of the 5th intercostal space beneath the body of the muscle. These same lymph nodes are

in communication with the intrathoracic lymphatics and this serves to explain the occurrence of plague pneumonias secondarily to simple bubonic plague. In seven cases of secondary plague pneumonia investigated in Morocco the axillary buboes were without exception restricted to the subpectoral lymph nodes. *W. F. H.*

Parulkar (R. D.). **Eight Cases of Plague treated with " Bayer 205."**—*Indian Med. Gaz.* 1933. Nov. Vol. 68. No. 11. p. 632.

Only one of the eight cases recovered but " it should be stated that most of the patients had severe pneumonic complications."

W. F. H.

Borzenkov (A.) & Donskov (G.). **The Experimental Infection of the Tick, *Hyalomma volgense*, P. Schulze and E. Schlottke, 1929, with Plague.**—*Rev. Microbiol., Epidémiol. et Parasit.* 1933. Vol. 12. No. 1. pp. 25–30. [In Russian. English summary p. 30.]

On various occasions ticks (*Rhipicephalus schulzei* and *Ixodes autumnalis*) collected from marmots (suslik, *Citellus pigmaeus*, and tarabagan, *Arctomys bobac*) were found to harbour the plague bacillus. In order to establish the exact rôle of ticks in the propagation of plague the authors have undertaken a series of experiments with *Hyalomma volgense*, the cattle tick in the vicinity of Stalingrad (formerly Tsaritsin). The ticks were successfully infected by feeding on guinea-pigs, jerboas and marmots. They were capable of transmitting the infection to healthy rodents by the bite, while the inoculation of the faeces also produced infection. The results of the experiments were tested by the cultural method. Similar results were obtained with the larvae and nymphs of the tick. The plague bacilli were found to be viable in the intestine of the adult tick for at least 11 days, in the nymphs 3 days, and in the larvae 7 days. *C. A. Hoare.*

Bablet (J.) & Girard (G.). Peste pulmonaire primitive expérimentale du cobaye. [**Primary Pneumonic Plague in the Guineapig, Experimentally Produced.**]—*C. R. Soc. Biol.* 1933. Vol. 114. No. 31. pp. 471–473.

An incision was made in the middle line of the neck and a suspension of plague bacilli introduced into the trachea. With this technique and the use of a series of animals the course of the infection could be followed—plague pneumonia, septicaemia, and involvement of the spleen and liver. Death supervened between the 70th and 75th hour.

W. F. H.

Greval (S. D. S.) & Dalal (N. P.). **On *Bacillus pestis* : New Techniques in Serology.**]—*Indian Jl. Med. Res.* 1933. Oct. Vol. 21. No. 2. pp. 283–294.

It has always been found difficult to carry out an agglutination test with plague organisms owing to their liability to spontaneous sedimentation. The various methods hitherto described to overcome the difficulty have not been wholly satisfactory, and it is the object of the authors to describe a perfectly simple technique in detail, which has

been successful in their hands. They have also added absorption and complement fixation techniques for the recognition of *Past. pestis*.

The essence of the agglutination technique is the use of a stable suspension of the sediment from old broth cultures resuspended in normal salt solution. Normal salt agglutinated these suspensions in low dilution, but even this slight defect disappeared on the addition of a small quantity of formalin. Agglutination by the technique described is specific, in so far as the normal sera and the antisera available gave negative results, nor do such group organisms as *Past. avisepticus* and *bovisepticus* give anything but a poor reaction. It is otherwise, however, with *Past. pseudotuberculosis rodentium* which gives a powerfully positive reaction, although perhaps not quite to the limits of *Past. pestis*.

The absorption tests and complement fixation tests have proved as successful as the agglutination tests and with the former of these identification of a fresh culture of a suspected plague bacillus from rats can be arrived at in 48 to 72 hours. Not all culture deposits, it has been found, form suitable suspensions for serological tests but the great majority do. The antigen in the complement fixation test is a filtrate from the broth cultures of *Past. pestis*. *W. F. H.*

Pons (R.). Influence des injections répétées de bactériophage spécifique dilué sur l'évolution de l'infection pesteuse expérimentale du cobaye. [**Effect of Repeated Injections of Dilute Bacteriophage on the Development of Experimental Plague.**]—*C. R. Soc. Biol.* 1933. Vol. 114. No. 37. pp. 1066–1068.

It has not yet been possible to check the course of plague in guineapigs by subcutaneous injection of bacteriophage. The author provides an explanation of this failure by suggesting a toxaemia as the cause of death, which has been produced by the solvent action of bacteriophage on plague bacilli. Thus the bacteriophage becomes a pathogenic, a toxic, and not a therapeutic factor, in conjunction with the causal agent of plague.

Guineapigs which are injected with a strong dose of bacteriophage, when plague septicaemia is at a maximum, die even more quickly than the controls. Repeated and early injections of dilute bacteriophage delay the development of the infection but never prevent it. What is very striking at the autopsy of the animal is the fatty degeneration of the liver. The liver is chamois-coloured, floats in water and is in a state of complete fatty transformation without any indication of necrosis or of septic foci and it is sterile. In the course of the repeated injections of bacteriophage the lytic principle sets free, after each injection, toxic bacterial substance which gives rise presumably to this fatty degeneration. An extension of the argument is made to an *in vivo* effect upon the bacteria. This would be similar to that *in vitro* effect, which is productive of two types of colony growth, one pathogenic and the other non-pathogenic, with a marked difference in colony appearance. If this also takes place *in vivo* as a result of injection of dilute bacteriophage, it seems reasonable to ask in the words of the author, " if we are not in presence of a general phenomenon of exaltation of virulence or toxicity, which would suffice to explain facts concerning the loss or recovery of pathogenic power by bacteria."

W. F. H.

Lépine (P.) & Bilfinger (Fr.). Existence, dans le sérum de rats d'Athènes, d'un principe lytique pour le bacille pesteux. [**Lytic Principle to the Plague Bacillus in the Serum of Rats of Athens.**]—*C. R. Soc. Biol.* 1934. Vol. 115. No. 2. pp. 131–132.

The serum of 217 rats, which were a sample of 600 examined for plague, was in two cases lytic for *Past. pestis*. No evidence was obtained of any enzootic rat plague being in existence at the time.

W. F. H.

Holsendorf (B. E.). Les abris à rats et leur rapport avec la propagation de la peste bubonique. [**Shelter for Rats in its Relation to the Transmission of Plague.**]—*Bull. Office Internat. d'Hyg. Publique.* 1933. Nov. Vol. 25. No. 11. pp. 1952–1955.

The thesis maintained in this communication is that the provision of shelter in rat infested buildings is a more important factor in the continued propagation of plague than the type of place where they are captured. If the shelter for rats is not good the flea index is found to be too low for effective transmission of plague. Rat proofing of buildings therefore not only keeps rats out of them but also reduces the degree of infestation with fleas, the insect vectors of plague. *W. F. H.*

Boyé. Les résultats des vaccinations antipesteuses dans les colonies françaises (Sénégal et Madagascar, année 1932). [**Plague Vaccination in Senegal and Madagascar.**]—*Bull. Office Internat. d'Hyg. Publique.* 1933. Nov. Vol. 25. No. 11. pp. 1933–1942. With 1 graph.

The results of plague vaccination which are set out in this memorandum are notable for the great frankness with which the author presents his negative instances.

His arguments begin in the usual way and we are led to expect the usual contrast in percentage results, always exceedingly adverse to the non-vaccinated individuals and practically always unaccompanied by any attempt to show that the two populations concerned are in any way comparable. He enters into a discussion of the relative value of lipovaccine and of the watery vaccine " P.S.T.", the one of which had been used in one zone and the other in another zone. The lesson of vaccination results is then further driven home by reference to a particular instance of an accidentally unvaccinated hamlet with its 36 inhabitants, 14 cases of plague and 10 deaths. These cases were unique in the locality, for " *all the vaccinated* remained immune." One began to wonder why the author italicized his words—" a demonstration *apparently* convincing of the protective action of the vaccinations," and again :—" This island of non-vaccinated decimated by plague, surrounded by the vaccinated who remained untouched, *appeared* to afford an involuntary experiment demonstratively favourable to the vaccination." Then comes the disillusionment. " Unfortunately the observations made in the third zone show how dangerous it is to accept as proven conclusions which seem to be self-evident." The third zone had for a long time past been visited by plague every year. It was made a control zone, in which the general measures adopted in the other two zones against rat and flea were applied here also, but not a single

vaccination was carried out. The control zone, however, did not furnish a single case of plague. Other instances follow of a like nature. One fact, however, is indisputable, and is that the number of cases of plague in Senegal generally have steadily declined during the past six years.

The author describes some experiments at the end of his memorandum, which have been carried out in Madagascar, and which would show by animal experiment how much superior a vaccine containing living avirulent plague bacilli is to one in which the bacilli of a vaccine have been killed by heat or antiseptics. *W. F. H.*

Flu (P. C.). Immuniseering van ratten tegen pest door middel van geconcentreerde bacteriophaaglysaten van virulente pestbacterien.—*Nederl. Tijdschr. v. Hyg., Microbiol. en Serol.* 1933. Vol. 8. No. 3. pp. 245–264. [14 refs.]

CHOLERA.

Kleine (F. K.). Die Entdeckung des Cholerabazillus vor 50 Jahren. [**The Fiftieth Anniversary of the Discovery of the Cholera Vibrio.**]—*Deut. Med. Woch.* 1934. Feb. 9. Vol. 60. No. 6. pp. 222–223.

Anniversaries serve to remind us of the progress of science, in this case of the comparatively new science of bacteriology. The discovery of the cholera vibrio, fifty years ago, in December 1883 represented a momentous addition to the very few pathogenic organisms known at that early period. Almost equally important was the use from that time onwards of the method of pure culture on solid media which was destined to " unveil the causes of many fatal infections." The credit of this discovery and of the introduction of these methods can without any dispute be accorded to Robert Koch. A German commission, with Koch as leader, landed in Egypt on 24th August 1883. Cholera had broken out there and Europe was afraid of an epidemic incursion. Some of the early views on the genesis of cholera are interesting to look back upon—its spontaneous origin, its origin from the putrefying bodies of dead rinderpest oxen which had been consigned to the Nile, the monsoon wind and the rise and fall of the subsoil water. What seems to have attracted Koch's attention first was the presence of a definite type of bacillius in microscopic sections of lesions of the intestine in cholera cases. A subsidence of the epidemic in Egypt brought the German enquiry to an end, but the indefatigable Koch obtained permission to go on to British India to pursue his investigations of this bacillus. Every facility was accorded to him at the Medical College Hospital, Calcutta, and there he found the same bacillus in the intestinal tract of cholera cases. He showed likewise that it was absent from the tract in other diseases, that animals did not suffer from cholera during an epidemic and that animals could not be infected with his new-found bacillus. On the 2nd February 1884 Koch announced to the German Government the fact that his bacillus was the true cause of cholera. Those who wish to read how much opposition was still given to his views may find them set out in the transactions of the Berlin cholera conference.

W. F. Harvey.

Huri (Maurice). Sur un vibrion isolé à Damas (Syrie) dans des cas de diarrhée d'été chez l'homme, *Vibrio enteritidis* (n. sp.). [*Vibrio enteritidis* **a New Species from Cases of Summer Diarrhoea in Damascus.**]—*Ann. Inst. Pasteur.* 1933. Nov. Vol. 51. No. 5. pp. 640–649.

In this research the author gives reasons for regarding the vibrio so constantly isolated by him in a chronic low form of summer diarrhoea, with green slightly gelatinous motions, as the causal agent of the condition.

This vibrio could always be isolated in every successive attack succeeding the original acute attack. It possessed a rapid zig-zag motility ; had only one flagellum, occasionally, however, one at either end ; produced a slight pellicle ; was strictly aerobic ; had no proteolytic character and was not agglutinated by anti-cholera serum. Its pathogenic action on animals was variable, it being pathogenic to *Macacus cynomologus* and the mouse, quite non-pathogenic to the

guineapig. Both intraperitoneal and subcutaneous injections in the monkey were productive of the disease and the vibrio could be obtained from the stools. *W. F. H.*

Kubo (Hisao) & Ku-Lien-Yuan. **Pathological Anatomy of Cholera Asiatica.**—*Jl. Oriental Med.* 1933. Nov. Vol. 19. No. 5. [In Japanese. English summary pp. 68–69.]

In their autopsy of three cases of true cholera the authors found that in all three the common bile duct was patent and that there was no hindrance to the entry of bile into the intestine. The rice water character of cholera stools is, therefore, not due to absence of bile. It seems to them probable that it is the great increase in volume of the intestinal contents which accounts for their colour. The quantity of bile secreted is "not sufficient to tinge the contents with its own colour." *W. F. H.*

Parrino (G.). Influenza del pH del terreno di coltura su alcune proprietà biologiche del V. del colera. [**Influence of the pH of the Medium on the Cholera Vibrio.**]—*Ann. d'Igiene.* 1933. Aug. Vol. 43. No. 8. pp. 558–564. [10 refs.]

A study has been made in 10 strains of cholera and 3 strains of cholera-like vibrios of the alteration of biological characters in media of pH 5·9, 7 and 8·5. Those cultivated repeatedly at 8·5 showed increase of haemolytic power, more intense nitroso-indole reaction and some strains also greater agglutinability. At 5·9 these characteristics were reversed but in no case was there any modification of virulence, power of liquefaction of gelatin, or of type of colony. One strain, however, independently of the reaction, showed dissociation into smooth and rough colonies. *W. F. H.*

i. Scholtens (R. Th.). Analyse des récepteurs du vibrion cholérique. [**Cholera Vibrio Receptors.**]—*C. R. Soc. Biol.* 1933. Vol. 114. No. 31. pp. 420–422.

ii. ——. Sur la sommation des actions des deux agglutinines du vibrion cholérique dans les hautes dilutions. [**Summation of the Actions of the Two Agglutinins of the Cholera Vibrio in High Dilutions.**]—*Ibid.* pp. 422–424.

i. Serums prepared by the author were shown, by means of absorption experiments, to contain either one or two agglutinins for the various cholera vibrio and El Tor strains used by him. These strains can be divided into two categories according to their antigenic characters, (1) those with two types of receptor, capable of producing two kinds of agglutinin and (2) those with only one kind of receptor. One strain of cholera vibrio, although it did not furnish two types of agglutinin, was still able to absorb them both and was agglutinated by both. This fact suggests that the phenomenon may really be a somewhat complicated one.

ii. In the second paper various hypotheses are considered to account for the fact that absorption of one agglutinin from a two-agglutinin serum results not only in disappearance of agglutinating power for the vibrios with one agglutinin receptor but also in a definite diminution in agglutinating power for vibrios with two agglutinin receptors. The

hypothesis favoured is one of a combined action of the two agglutinins exercised at low dilutions and too feeble to give flocculation when one or other is separately present. *W. F. H.*

Linton (Richard W.) & Shrivastava (D. L.). **Studies on the Antigenic Structure of *Vibrio cholerae*. Part III. Further Analyses of Specific Carbohydrates.**—*Indian Jl. Med. Res.* 1933. Oct. Vol. 21. No. 2. pp. 379–384.

——, —— & Mitra (B. N.). **Part IV. A Preliminary Examination of Carbohydrates in the Rice-Water Stools of Cholera Patients.**—*Ibid.* pp. 385–388.

Chemical studies of antigenic structure attack the problem of bacterial specificity in what must be its ultimate significance. The first of these studies tells of a modification of the deduction previously made, perhaps not unexpected, that the chemical difference between cholera and water vibrios, represented by possession of galactose- and arabinose-containing carbohydrate, is not as absolute as was thought. It is the object of this study to show that the distinction cannot be made, as the authors have found two strains of clinically cholera vibrios which possess the arabinose-containing carbohydrate. By this finding the water vibrio is again approximated to the cholera vibrio, instead of being sharply divided from it. A full description of the technique is given.

In the second communication the chemical analysis is transferred from the vibrios themselves to the faeces of patients suffering from the disease, and it has been possible to show that the rice water stools of eleven cases of cholera furnish polysaccharides. "Upon hydrolysis these polysaccharides yield reducing sugars which have been tentatively identified as galactose and arabinose" . . . "These are the characteristic sugars of the specific carbohydrates of the vibrios, when grown *in vitro*." *W. F. H.*

Linton (Richard W.) & Shrivastava (D. L.). **Further Studies on the Specific Carbohydrates of *Vibrio cholerae* and Related Organisms.**—*Proc. Soc. Experim. Biol. & Med.* 1933. Dec. Vol. 31. No. 3. pp. 406–409.

The authors find in this continuation research that a clear cut difference between cholera and cholera-like vibrios is not furnished by their specific carbohydrate content. Twenty-six agglutinable vibrios from clinical cholera contained galactose and eight arabinose. Four non-agglutinable water vibrios showed on analysis arabinose-containing polysaccharide. "Polysaccharides containing both arabinose and galactose have been isolated from 'rice-water' stools of cholera cases." *W. F. H.*

Sulmann (Felix). Variationen bei Bakterien. II. Experimentelle Virulenzsteigerung von Choleravibrionen durch Selektion ueberlebender Stämme. [**Increase of Virulence of Cholera Vibrio by Selection of Surviving Strains.**]—*Ztschr. f. Immunitätsf. u. Experim. Therap.* 1933. Dec. 15. Vol. 81. No. 1/2. pp. 32–46. [14 refs.]

Those cholera vibrios surviving in old cultures after exposure to ultra-violet rays, and after subjection to heat, were examined in regard to the changes resulting in colony form and virulence. The research, it is explained, was parallel to and had its origin in the investigation made

after the B.C.G. catastrophe into the development of a virulent S-variant out of an avirulent R-strain. It was found that the virulence and colony form of El Tor vibrios after 6 months in old agar culture did not differ from those which had been daily subcultured up to that time. No difference, likewise, could be detected as a result of ultra-violet radiation. More success was obtained with heat, for in 4, or it may be 6, cases out of 24 it was possible to isolate strains, after exposure for 8–28 minutes at 48°C., whose virulence was increased. The author ascribes this increase to a selection of especially toxic variants. A similar investigation into the variation possibilities of *prodigiosus* pigment showed that an addition of saccharose, maltose or lactose to the nutrient agar transformed a previously stable white form into the red form. *W. F. H.*

SHILLONG. **King Edward VII Memorial Pasteur Institute and Medical Research Institute. The Sixteenth Annual Report for the Year ending 31st December 1932** [MORISON (J.), Director].—31 pp. 1933. Assam Govt. Press. [1s. 8d ; Re. 1–2.]

A great part of this report is taken up with tables relating to rabies statistics, which are of the regulation type. We look especially, however, in perusing the report for information relative to research on bacteriophage in the laboratory and in the field. Nine cholera phage types named A to J have now been isolated, " each producing its own characteristic 'phage resistant strain of cholera." The field experiment on the preventive value of distributed cholera phage continued throughout the villages of Nowgong and a total of 27 deaths from cholera was recorded in 1932. Thus the cholera deaths for the three years of experiment amount to 124, which is the lowest for any three consecutive years since 1906. Habiganj, the control area to Nowgong in this experiment, has now adopted phage distribution and so ceases to be a control. Even better controls to Nowgong, however, are certain neighbouring districts. It has been possible to compare the incidence of cholera in Darrang with that of Nowgong by means of a changing correlation coefficient, a change which is expressed as being from a positive high coefficient of +0·6 for 1906 to 1929 to a negative coefficient of −0·1 after 1929. " Something has happened in Nowgong, a district of 560,000 people, which has not happened before, has not happened in the control districts and is not correlated with the diminution of cholera in the province. The only cause that we know of is the distribution of the bacteriophage to the villages." *W. F. H.*

BIEN (Charles W.) & TUNG (Chen-Lang). Electrocardiographic Changes in Cholera.—*Chinese Med. Jl.* 1933. July. Vol. 47. No. 7. pp. 662–665.

CHINESE MEDICAL JOURNAL. 1933. Aug. Vol. 47. No. 8. pp. 816–817.—Laboratory Methods. Standard Bacteriological Diagnosis of Cholera. Recommended by the Central Cholera Bureau, Shanghai.

KIRIBAYASHI (Shigeru) & AIDA (T.). A Study of the Fate of Cholera Vibrio in the Sea Water of Keelung Port, Formosa.—*Jl. Public Health Assoc. of Japan.* 1933. Nov. Vol. 9. No. 11. pp. 1–9.

MANAKO (K.). Cholera and Cholera-like Vibrio. Part I. Types and Biological Characters of Cholera Vibrios prevailing in Manchuria during the Summer of 1932.—*Jl. Oriental Med.* 1933. Nov. Vol. 19. No. 5. [In Japanese. English summary p. 64.]

TROPICAL DERMATOLOGY.

Catanei (A.). Etudes sur les teignes. [**A Study of Ringworm.**]—*Arch. Inst. Pasteur d'Algérie.* 1933. Sept. Vol. 11. No. 3. pp. 267–399. With 8 diagrams, 5 figs. & 13 plates. [19 refs.]

This long paper really constitutes a monograph on " Ringworm in Algeria."

The first chapter is devoted to epidemiology, the second to the clinical features of the disease, the third to the characteristics of the numerous fungi, and the last section contains details of experiments on animals, etc. Many excellent photographs help to make this the standard work on its subject, but its greatest value will be to those who are working in North Africa and to mycologists.

M. Sydney Thomson.

Ildrim (D.). Die Dermatomykosen Favus trichophytia und microsporia in Aserbaydshan (Transkaukasus). [**Favus and Microsporon Infection in Azerbaijan (Transcaucasus).**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1933. Nov. Vol. 37. No. 11. pp. 505–508. With 3 figs.

An investigation into the local incidence of these diseases.

During 1926 a total of 7,584 cases of dermatomycosis were seen. Of these, 430 were carefully studied with the result that 323 were proved to be due to Achorion and 24 to Microsporon infections. Of the 83 Trichophyton infections, *T. gypseum granulosum* proved to be the most common with 16 examples. Among 265 patients, 60 per cent. were proved to have been infected through relatives and 89 per cent. were under the age of 15 years. Favus is locally known as " Ketschal " and patients are even called " Ketschal-Mamed," etc., by their friends. nicknames which often stick to their victims throughout life.

M. S. T.

Burnier & Duché (J.). [Un cas d'épidermomycose due à *Trichophyton rubidum.*] [**A Case of Epidermomycosis due to** *Trichophyton rubidum.*]—*Bull. Soc. Française Dermat. et Syph.* 1933. Vol. 4. pp. 379–380. [Summarized in *Rev. Applied Mycology.* 1933. Sept. Vol. 12. Pt. 9. p. 569.]

" Clinical details are given of an erythemato-squamous epidermomycosis of the thighs and legs in a female patient, who contracted the disorder during a stay in the Cameroons. The fungus isolated from the squamae was characterized by a downy, white colony with a red edge and septate hyphae 3 to 4 μ in diameter, and therefore agrees with *Trichophyton rubidum* Priestley, hitherto reported only from Asia and Oceania. In an unpublished article Ota divides *T. rubrum* into four categories according to the mode of pigmentation, viz., red mycelium with or without diffused pigment, and white mycelium with or without diffused pigment. On this basis the fungus under observation would belong to the third of these groups. Morphologically, however, it presents the characters of an *Epidermophyton*, the spindles resembling those of *E. inguinale* [*E. floccosum*: *loc. cit.*], from which it differs, however, in the site of its occurrence on the body."

DE ALMEIDA (Floriano). As blastomycoses no Brasil. [**Blastomycosis in Brazil.**]—*Ann. Facul. de Med. de São Paulo.* 1933. Vol. 9. pp. 69–163. With 67 figs. on 31 plates. [128 refs.] English summary.

A detailed study of the different organisms that have been incriminated.

This excellent work is concluded by an English summary (p. 154) which is very adequate. The first chapter defines the subject and presents a classification of the fungi. Each of the remaining ten chapters deals with all the characteristics of a particular organism. Their titles may thus be summarized as: *Candida albicans, Candida butantanensis, Neogeotrichum pulmoneum, Torulopsis dermatitidis, Proteomyces infestans, Coccidioides immitis, Pseudococcidioides mazzai, Paracoccidioides brasiliensis, Rhinosporidium seeberi, Trichosporium pedrosoi.* The work is very well illustrated and will prove of great value to those interested in this subject. *M. S. T.*

CARRIÓN (A. L.) & KOPPISCH (E.). **Observations on Dermatomycosis in Puerto Rico. Report on a Case of Chromoblastomycosis.**—*Puerto Rico Jl. of Public Health & Trop. Med.* 1933. Dec. Vol. 9. No. 2. pp. 169–190. With 18 plates. [10 refs.] [Spanish version pp. 191–193.]

Describes the first case of Chromoblastomycosis to be recognized in Puerto Rico.

The patient, a male white labourer aged 50, first noticed a small, itchy papule on the dorsum of the left foot some fifteen years before. This lesion gradually spread excentrically and new efflorescences appeared. Each year has seen an extension until the whole of the leg up to the middle of the thigh became involved. The eruption was very polymorphic; dull red plaques of infiltration up to 3 in. in diameter, nodules from which a cheesy material could be expressed, prominent and irregular fungating areas and ulceration. The lower part of the leg was thickened and oedematous. Deep metastatic nodules were present in the right thigh and left forearm.

Each type of lesion was examined histologically and showed pseudo-tubercles surrounded by a varying degree of fibrosis. The organism was isolated from each of these tissues and also from the metastatic foci. Hanging-drop and plate cultures were made. The parasite belongs to the genus *Hormodendrum*, but the species has not been definitely established as yet. Of 22 animals (monkeys, rabbits and white rats) inoculated experimentally, only one white rat showed disease at autopsy.

Considerable improvement has occurred as a result of the daily administration of high doses of sodium iodide intravenously over a period of approximately two years.

The illustrations are all excellent. *M. S. T.*

CATANEI (A.) & LEGROUX (Ch.). Un nouveau cas de mycétome observé en Algérie. [**A New Case of Mycetoma in Algeria.**]—*Arch. Inst. Pasteur d'Algérie.* 1931. June. Vol. 9. No. 2. pp. 378–381. With 2 plates. [14 refs.]

In describing shortly with radiographs an advanced case of Madura foot with yellow grains (*Nocardia madurae*) the authors give a chronological account of the observations on mycetoma in Algeria since the

first in 1892. These are 15. The causative fungi, which were isolated in 14, are :—

Nocardia madurae (H. Vincent, 1894)	isolated	10	times
Scedosporium apiospermum (Saccardo, 1911)	,,	2	,,
Madurella mycetomi (Laveran, 1902)	,,	1	,,
Glenospora clapieri Catanei, 1927 ...	,,	1	,,

A. G. B.

Elmes (B. G. T.). **A Case of Black Grain Mycetoma.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1934. Jan. 31. Vol. 27. No. 4. pp. 417–419. With 2 figs. on 1 plate.

A record of the first case of Black Grain Mycetoma recognized in Nigeria.

The tumour, measuring 4 in. by 2½ in., was removed from the outer side of the knee of a native of Bornu Province, Northern Nigeria. It consisted of fibrous tissue riddled with sinuses and containing one or two larger abscess cavities filled with necrotic material. The lacunae contained a soft greyish-yellow rather greasy substance dotted with black grains. These grains were hard, brittle and irregular, measuring 0·5 to 1 mm. in diameter. Details are given of the histological appearances, but not of the cultural features. The organism was identified by J. T. Duncan as *Madurella mycetomi*. *M. S. T.*

Loewenthal (L. J. A.). **A New Cutaneous Manifestation in the Syndrome of Vitamin A Deficiency.**—*Arch. Dermat. & Syph.* 1933. Nov. Vol. 28. No. 5. pp. 700–708. With 2 figs. [Summary appears also in *Bulletin of Hygiene.*]

A peculiar dermatosis was noted in the inmates of the Uganda Central Prisons and the majority of the 150 cases noted also suffered from night-blindness and xerophthalmia.

The clinical features of this condition are :—(1) dryness of the skin affecting the whole body except the face and scalp ; (2) itching, which is a prominent feature ; (3) a papular eruption, which is typical of the condition. The papules are about ¼ inch across, smooth-topped, black and shiny ; the edges are sharply demarcated and their shape is round or polygonal. They are not as obtuse or coniform as the acne papule. They are found almost invariably on the extensor aspect of the arms and on the front and outer surfaces of the thighs. They may be present to a variable extent on the buttocks, loins, chest and back ; (4) folliculitis without the presence of pus is sometimes present, the inflamed follicles may be an early stage of the papule ; (5) acne, without pustulation, is common and is seen in the middle-aged as well as the young men. Histologically the papules are typical ; the pilo-sebaceous follicle is completely sealed with a mass of horny tissue. The skin adjacent to the follicle is thickened until at its margin the stratum corneum is three times its previous thickness. The prickle cell layer shows marked acanthosis in the perifollicular region and the interpapillary processes are much elongated, whilst in the basal layer there is distortion of the cells and a varying degree of polymorphonuclear infiltration. In the corium there are signs of perifolliculitis with invasion by lymphocytes and fibroblasts. There is no increase in the chromatophores but the pigment is increased per square unit of surface, producing the blackness of the papule. The condition clears up in

from 1 to 9 weeks after commencing treatment with cod liver oil, though it does not respond so quickly as the eye lesions. A deprivation of fat alone does not cause this skin eruption and the evidence is all in favour of vitamin A deficiency being the sole cause. *H. N. H. Green.*

Buist (T. P.), Bhatnagar (S. S.) & Carr (L. H.). **Pyosis Mansoni and Allied Infections of the Skin in India.**—*Jl. Roy. Army Med. Corps.* 1934. Jan. Vol. 62. No. 1. pp. 47–50.

A description of the clinical features and treatment of cases seen in India during 1929, 1931 and 1932.

The forty-six cases of pyosis were clinically typical. The usual intracellular and extracellular Gram-positive diplococci were found in smears. In none of the cases were any chain forms detected. On culture this diplococcal arrangement was never entirely lost, although the colonies proved otherwise indistinguishable from *Staphylococcus pyogenes aureus*. Anaerobic cultures were not attempted. A mixed strain vaccine of 150, 250 and 450 millions at four-day intervals proved very efficient. For local treatment resinol, 1 per cent. mercurochrome and Ung. hydrarg. nit. dil. were used. The same organisms were also found in conditions which were clinically typical of foot tetter, sycosis barbae, eczematoid dermatitis of the hands and purulent dermatitis of the feet. *M. S. T.*

Aparicio (Manuel). Ueber Narbenbildung beim Mal del Pinto und ihren Charakter bei der Leiche. [**The " Scarring " of Pinta and its Structure as determined from Post-mortem Specimens.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1933. June. Vol. 37. No. 6. pp. 318–319. With 1 fig.

Material was obtained from the bodies of three patients who had died of different diseases. It is stated that the white appearance of the old patches was found to extend deeply into the subcutaneous tissues and even through muscle, right down to bone. The deeper the " scar " the wider did it become so that the total area is likened to a bottle. Pigment was present in some quantity and the deeper parts showed definite melanosis, *e.g.*, the definite deposition of pigment in the muscle-fibres close to bone. It is suggested that these changes may be the result of salvarsan treatment, post-mortem effects or even that they form a part of the disease. *M. S. T.*

Becker (S. William). **Vitiligo. A Clinical and Histologic Study, with a Consideration of Pinta.**—*Arch. Dermat. & Syph.* 1933. Oct. Vol. 28. No. 4. pp. 497–507. With 5 figs. [13 refs.]

Two cases of vitiligo were subjected to ultra-violet radiation and pieces of skin were frequently excised for microscopical examination. In one patient a small amount of pigmentation followed treatment. This pigmentary activity was also proved by the formation of dendritic melanoblasts and by irregularity of the epidermodermal junction with local cellular infiltration. Cellules claires of Masson were found in the depigmented areas. Sections were also prepared from material obtained from cases of pinta at different stages of development. First there appears an inflammatory reaction with marked acanthosis which is immediately followed by a very intense chromatophore pigmentation.

This melanosis is then gradually absorbed until the patch is completely depigmented. Then there is an absolute disappearance of melanoblasts and Masson's cells, a disappearance which may explain the very great resistance to treatment found in the vitiligo-like patches of pinta.

M. S. T.

Castellani (Aldo). Case of Tokelau (Tinea imbricata) of Fifteen Years' Standing in a European. Reprinted from *Med. Press & Circular.* 1933. May 17. 4 pp. With 2 figs.

Castellani (Aldo). Blastomycosis : a Short General Account.—Reprinted from *Med. Press & Circular.* 1933. May 31. 16 pp. With 9 figs.

Kanagarayer (K.). A Case of Cutaneous Blastomycosis of the Ear.—*Malayan Med. Jl.* 1933. Sept. Vol. 8. No. 3. pp. 203–205. With 2 plates.

Niño (Flavio L.). Nueva observación de tricopatía piédrica por " Piedraia Hortai " en la República Argentina.—*Prensa Méd. Argentina.* 1933. July 26 & Aug. 2. Vol. 20. Nos. 30 & 31. pp. 1661–1671 ; 1699–1712. With 23 figs. [28 refs.]

MISCELLANEOUS.

i. HEALTH. Canberra. 1933. Sept. Vol. 11. No. 9. pp. 73–88. **Commonwealth Activity in the Field of Tropical Hygiene.**

ii. CILENTO (R. W.). **Australia's Problems in the Tropics.**—Reprinted from *Rep. of Australian & New Zealand Assoc. for Advancement of Science.* Vol. 21. pp. 216–233.

These two papers deal respectively with Commonwealth activity in the field of tropical medicine as regards institutions and state action and with the problems that Australia has to solve, or is in process of solving, in her tropical parts. They are historical surveys which supplement one another.

i. The first responsibility for tropical medicine assumed by the Commonwealth Government was the Papua Act, 1906, whereby it became responsible for that tropical territory; by the Quarantine Act, 1908, the Commonwealth undertook the control of quarantinable diseases; and in 1910 the Institute of Tropical Medicine was opened at Townsville, Queensland. From 1913 the Institute carried out a survey of tropical diseases existent in North Queensland, including the incidence of human and animal parasites, followed by a survey of the Torres Straits Islands and the Northern Territory. Whereas in the Islands several tropical diseases were noted, in the Territory there was little but yaws and ulcerative granuloma, and hardly any malaria. The physiological changes of a white population living under the conditions prevailing in the coastal districts of tropical Australia were next studied—with an interruption caused by the War. In 1920 the Australasian Medical Congress to which the results of all these activities were submitted passed a resolution in which *inter alia* the opinion was expressed that "the whole question of successful development and settlement of Tropical Australia by white races is fundamentally a question of applied public health in the modern sense." The Congress was "unable to find anything pointing to the existence of inherent or insuperable obstacles in the way of the permanent occupation of tropical Australia by a healthy, indigenous, white race." Moreover it considered that "the absence of semi-civilised coloured peoples in Northern Australia simplifies the problem very greatly." The Congress called for an improvement in the quarantine defence system, the establishment of diagnosis laboratories at four places in the N. Territory and tropical Queensland, and the extension of the Hookworm Campaign to include the geographical distribution of malaria and filaria, indicating the measures needed for their eradication.

These suggestions have been acted upon. The Hookworm Campaign which had been carried on for 16 years and on which the Commonwealth has spent over £57,000 came to an end in 1933; the problem in Dr. CILENTO's phrase is "effectively and satisfactorily finalized." In 1921 on the occasion of Dr. HEISER's visiting Australia he was asked to advise on the future development of the Townsville Institute. He suggested that it should cease to be primarily a research institute and should become a central laboratory and administrative headquarters for dealing with the principal health problems of tropical Australia, Papua, and late German New Guinea. Meantime the mandated territories of Nauru and the "Territory of New Guinea" had been placed under the Commonwealth. In 1924 Dr. CILENTO was seconded for duty for one

year as Director of Public Health in the Mandated Territory, and in 1925 he recommended in evidence before a Royal Commission the establishment of an institution of university rank where degrees in hygiene, including tropical hygiene, could be bestowed, indicating Sydney as the most suitable place. A School of Public Health and Tropical Medicine was accordingly founded at Sydney in March 1930, to be managed jointly by the Commonwealth and the University of Sydney.

A synopsis is given of the work accomplished by the School ; it acts as a clearing house for information on every aspect of public health and tropical medicine, and is recognized by the Colonial Office as an approved training school for medical appointees to the Colonial Services. Native medical assistants from Papua are to be trained there in the summer of 1933–4.

ii. Dr. Cilento, now the Chief Quarantine Officer (General) North-Eastern Division, with headquarters at Brisbane, delivered this Presidential Address before the Australian and New Zealand Association for the Advancement of Science (Section of Medical Science and National Health). The lecturer pointed out that the tropical portion of Australia and her dependencies together make up the largest tropical possession within the British Empire, the tropical part of Australia alone forming an area 20 per cent. larger than British India and its administrated territories, and five times as large as Kenya Colony and Protectorate ; moreover it contains " the largest collection of a population purely white within the tropics of the world." With the exception of a small area in Central Australia, no part has a rainfall below 10 inches, and most receives 20–30 inches. The total area of the tropics in and administered by Australia is 1,332,320 square miles.

In the settlement of tropical Australia three distinct periods are recognized—(1) that of strategic dispersal (2) that of economic extension with coloured labour and (3) the post-federation period.

(1) In this period the only attempts at settlement in tropical Australia were tiny out-posts in the far north ; here the chief ailment was scurvy ; there is one record of malaria but it was apparently non-indigenous. In this period there is no evidence of the existence of any form of tropical disease in northern Australia.

(2) The introduction of coloured labour began in 1863 when 67 kanakas were brought to Brisbane. Chinese were also introduced to work the mines in Queensland. The kanaka traffic went on till 1890, though by 1877 attention has been called to the appalling mortality, which a medical board reporting in 1880 attributed to " poor feeding, bad water, over-work and the absence of proper care when sick." Up to 1890 46,387 Islanders had been introduced. Throughout the period of coloured labour the crude death rates for white men were enormously in excess of those of other States so that anyone in search of arguments against the suitability of the country for settlement would not have been at a loss ; it was, however, evidence not of the unsuitability of the country but of the results that follow the introduction of a disease-ridden class of coloured indentured labour. The exclusion of coloured labour in 1901 saved Australia from the " poor white." In the Northern Territory in this period there were several outbreaks of malaria which became endemic over a large area of country. Leprosy was not endemic among the aborigines ; it is clear that it was introduced in the immigration subsequent to the foundation of the British Colony.

(3) Federation, 1900–1, had a marked effect upon tropical medicine in Australia. Study at the Townsville Institute showed what the endemic diseases of tropical Australia were and these are considered in turn.

Malaria is confined at present to a small area in north-west Australia, and two areas in N. Queensland, and almost entirely to cattlemen, miners and sugar-cane labourers ; in the Northern Territory it is found on the two watersheds where settlement is very sparse. The distribution of anophelines is heavy but extension of malaria among the white population has only occurred " where conditions have been primitive, where hardships are constant, and where sanitation is poor and work heavy." In the present decade malaria accounts for death in 5 out of a million but the situation might be altered by any unexpected concentration of people or slackening of hygienic control.

Filariasis appears in the records in 1883, chiefly at Brisbane ; at one time 15 per cent. of patients in the surgical wards of the hospital were infected. To the north the whole of the eastern coast was affected but not inland towns. Elephantiasis is relatively uncommon but is common enough in the tropical dependencies. One may reasonably suppose that the filaria was introduced with the kanakas. It is uncertain, however, whether *Filaria malayi* is not present as well as *F. bancrofti*.

Hookworm disease was first reported in Queensland in 1889 but attracted little attention till 1916. The Hookworm Campaign, in which American aid was given, mapped Australia and its dependencies and instituted control measures.

" The disease has been localised in six endemic coastal areas, and resident nurses and sanitary inspectors appointed for its control. A list of locally resident infected persons, compiled from year to year by the intensive operations of the former ambulatory hookworm units, is placed in the hands of each resident nurse on her appointment to an endemic zone. It is then her duty to follow up each case to an absolute cure, and subsequently to keep the patient under observation to detect re-infection, if any. For the purpose, the nurses are specially trained in the microscopical diagnosis and the detail of treatment of the disease, to the point of absolute proficiency. To assist with the equally important feature of the work—the control of soil pollution and rural sanitation—sanitary inspectors, either those specially appointed to the hookworm unit, or locally-resident officers engaged in general health work, are charged with the correction of defects in every privy in the infected area, and particularly those in relation to actual cases of the disease."

Routine field work is now the province of each State. Though for white persons the hookworm is definitely under control, this is not so with the aboriginals. In any case the situation must be watched with great care for a decade at least. It is pointed out that the hookworm of Melanesia is *Necator americanus* and that of Asiatic immigrants *A. duodenale* ; that the latter is very much harder to expel and in Australian experience does not react to carbon tetrachloride.

Leprosy. New cases are still being reported from Rockhampton and its hinterland and for the whole coast north and west to Alligator Creek in the Northern Territory.

Other diseases in Queensland and the Northern Territory—undifferentiated fevers, ophthalmia, yaws, granuloma, trachoma, typhoid—have not received careful study.

In the author's Conclusions occurs this significant passage :—

"After the first flight of Sir Ross and Sir Keith Smith from England to Australia, it had been increasingly recognized that, geographically, tropical Australia was our front door, and the natural highway between Australia, civilization, and markets." *A. G. B.*

Barrett (James W.). **The Health of the People of Papua.** [Correspondence.]—*Med. Jl. Australia.* 1933. Dec. 16. 20th Year. Vol. 2. No. 25. pp. 835–836.

It appears from this letter that the Commonwealth of Australia has sent a number of Papuans to the University of Sydney for six months' instruction in the elements of medical science. The author suggests that training at the excellent native medical school at Suva, Fiji, would be far preferable. After the four years' course, the Papuans would return to their country, really well-trained and unspoilt by European contact. He agrees that it is impossible as well as unwise to attempt to staff Papua with European doctors. *A. G. B.*

Cunningham (E. R.), Kilborn (Leslie G.), Maxwell (James L.), Morse (W. R.), Mullett (Harrison J.) & Dickinson (F.). **The Nosu Tribes of West Szechwan. Notes on the Country and its Peoples and on the Diseases of the Region. With a Foreword by** Dr. Maxwell.—*Chinese Med. Jl.* 1933. Mar. Supplement. 56 pp. With 16 figs. on 8 plates & 1 folding chart. [16 refs.]

This brochure from the Henry Lester Institute, Shanghai, deals with a tribe or tribes inhabiting the southern bend of the Yangtse River in the south-western corner of the province of Szechwan, an area which is politically Chinese, but geographically forms part of the foot-hills of Tibet. Several investigators took part in the survey.

The Nosu have little in common with the Chinese and Chinese and Nosu have a mutual contempt for one another. The district is largely mountainous. Dr. James L. Maxwell made a preliminary survey of the general diseases met with and it is with this that we are here concerned. No case of *cholera* was met with ; the last serious epidemic occurred in 1910. The common *epidemic diseases* of children are strikingly absent. It is suggested that the small size of the villages and the wide separation of the houses together with the absence of easy communication account for such diseases failing to spread. *Smallpox* was obviously rare ; the Nosu contrasted strongly with the pock marked Chinese of the same region, and it is noted that the Nosu are strong believers in vaccination, which is arm to arm. A disease called *Han-bin* which is considered very fatal is believed to include typhus and relapsing fever, typhus being the chief cause of the fatality. The absence among the Nosu of *tuberculosis* in all its forms is remarked as striking, and here again the Chinese are contrasted. Only one case was noted, pulmonary tuberculosis in a Nosu who had settled in one of the cities of the valley. There was no disease of bones or joints, no evidence of tuberculous glands, old or recent. There is no immunity ; in schools where Nosu boys are admitted they are found very liable to pulmonary tubercle. The cause of the freedom must lie in the outdoor life in the mountains, and it is noted that the altitude ranges from

5,000–10,000 feet. *Leprosy* is very common and is probably the most important serious disease of the region. It is looked on with abhorrence, the sufferers are driven away and are even burned or buried alive. In consequence of this Dr. Maxwell saw only two cases among the mountain Nosu, one of which had failed of recognition by the tribesmen owing to " lack of involvement of the eyebrows with loss of hair." Lower down the valley several cases were seen among both Nosu and Chinese. *Syphilis* is widespread. *Malaria* exists in the lower valley but no case of splenic enlargement was noted in a " very large number " of children. *Ascariasis* was the most common affection of children. *Infantile diarrhoea* is common and very fatal; milk is not used. *Scabies* among the Chinese recalled the Chinese proverb, " Of ten men eleven have itch," but the Nosu rarely suffered : the author is unable to suggest an explanation. *Opium smoking* is more common among the Chinese here than in any part of China known to Maxwell ; 80 per cent. of adults are heavy smokers ; the Nosu, however, are not greatly affected. *Acute rheumatism* and the *vitamin deficiency diseases* seem to be absent.

Of 130 persons examined by Dr. Cunningham, the ophthalmologist, 30 had *trachoma*. Dr. Mullett, dentist, reported caries of the teeth as practically absent among 140 adults. *A. G. B.*

MARQUE. Les maladies transmissibles observées dans les colonies françaises et territoires sous mandat pendant l'année 1931. [**Transmissible Diseases seen in the French Colonies and Mandated Territories in 1931.**]—*Ann. de Méd. et de Pharm. Colon.* 1933. Apr.–May–June. Vol. 31. No. 2. pp. 123–322.

This long report, dealing as it does, with all the French colonies—in Africa, Asia, S. America and the Pacific—is in many parts little more than a catalogue.

The chronicle begins with *maladies pestilentielles*—yellow fever, cholera, plague and smallpox ; then takes up the *maladies endémo-épidémiques*—malaria, trypanosomiasis, dysentery, beriberi [which seems rather out of place in this company] ; *maladies transmissibles communes à la métropole et aux colonies* and finally *maladies sociales*—tuberculosis, venereal diseases, leprosy. A few notes gathered from the report follow.

At Dakar of bubonic *plague* there were 300 cases, of septicaemic 173 and of pulmonary 42. The proportion of septicaemic plague has passed from 6 per cent. in 1929 to 50 per cent. in 1931. The septicaemic form is seen in the poorest of the population and it is considered that the preponderance in them is due to lack of resistance. Rats are dealt with by traps and sulphur fumigation of their runs ; no less than 508,815 were caught. Of the fleas found on rats 80 per cent. are *X. cheopis*. Flea-traps, consisting of plates filled with oil in which floats a burning wick, have given good results, *e.g.*, 180 traps in one village accounted in one night for 2,554 fleas and in another for 2,166, but the author acknowledges that plague prophylaxis is difficult to effect by flea destruction. Plague vaccination, carried out on more than half the population, has not had striking results and is accepted with a " certain lassitude " by the people. In Madagascar inter-human infection is considered to play an important part in the bubonic as well as the pneumonic form.

In Indo-China *cholera* has been regressing since 1927, attributed by some to the campaign of vaccination carried out for three consecutive years.

Yellow fever in West Africa was represented by 40 cases, 10 of which were from the Ivory Coast, 11 from Upper Volta, 11 from the Sudan. The sporadicity of the cases was the chief characteristic. Many of them showed no obvious interdependence, but the contacts of non-Africans with the natives were very close ; instances are given.

Malaria is more fatal in Indo-China than in the French colonies in Africa. In the year under review it caused more deaths in Indo-China than did cholera, 1,697 against 1,643 ; more than half the cases in which the species of parasite was ascertained were subtertian. However, blackwater fever is much less common in Indo-China than in Africa.

Of *trypanosomiasis* the author writes that the disease is now mastered and that unless efforts are relaxed the future may be faced with confidence. Of 12 cases treated at Dakar it is said that the majority came from British Gambia. The disease is very prevalent in Upper Volta to the north-west of the Northern Territory of the Gold Coast. In the Koudougou district 5,796 new cases of infection were discovered, of whom 3,840 were " completely treated " and in the Gaoua district the corresponding figures are 1,689 and 736. In Togo trypanosomiasis exists only in the north-east ; here of 60,263 examined in this year 1,507 were found infected, 2·21 per cent., and 64,166 injections were given including 30,304 of tryparsamide. A number of natives, for economic reasons, were moved from the Binah valley, with the result that the disease is disappearing from among them though it is not stated that tsetse are absent from the new area.

In Cameroon in 562,583 examined, 1,937 fresh infections were found, 0·34 per cent. ; of old trypanosome infections there were 75,753. From the results of this and previous years it is believed that there are some 116,000 sleeping sickness patients alive, almost all in apparent good health. As the mortality gets less the birth-rate goes up, *e.g.*, in Akonolinga in 1922–3 there were 48,000 inhabitants, 4,900 deaths from sleeping sickness and 1,421 births : recent enquiry shows 59,000 inhabitants—2,025 deaths from sleeping sickness and 2,137 births. In French Equatorial Africa no less than 1,317,604 natives were examined ; among those there were 14,307 fresh infections, nearly 10,000 of them at the first stage ; 38,249 old patients were seen. The new infections are more numerous than in the two preceding years but this is attributed to the more complete investigation. Of 16,855 patients treated in hospital 674 died, 3·9 per cent. A table gives details for each of 28 sectors. The " index of fresh infection " is given as 1·08 per cent.

Under *Bilharziasis* an increase of the intestinal form is noted in Guadeloupe. At Basse-Terre 150 of 223 boys were infected and at a girls' school 93 out of 159 ; in 1914 Leger had found an index of 10. A fresh water supply is being procured in place of a river in which Planorbis are numerous. The same prevalence of intestinal schistosomiasis and absence of the vesical form is noted at Martinique.

Under *Filariasis* the author comments on the scantiness of the information received. Of guinea worm infestation in this year 10,023 cases were reported, 4,800 from Upper Volta. It is sought to prevent this infestation by the digging of wells in the villages.

Beriberi occurred chiefly in Indo-China ; there were 6,320 cases, 5,322 of which were credited to Cochin-China and 546 deaths. [The

table in which these deaths are allocated to five constituent colonies gives them incorrectly ; the figure 158 for Tonking should, according to the text, be 16]. The prevalence of the disease has been increasing for some years. In Cochin-China beriberi occurs in the rice-growing districts and is due to the abuse of white mechanically-polished rice.

Yaws is very common throughout French West Africa except in the Niger Colony and Senegal where it is very rare, and the Sudan where it is fairly common. In Upper Volta 7,060 cases were reported against 2,548 in 1930 ; two reasons given for the increase are the popularity of stovarsol treatment and the occurrence of many cases twice or more in the records. The same is true for the Ivory Coast, where the consumption of stovarsol has risen in 6 years from 25 to 170 kgm. In Guinea yaws is more frequent in the coastal than in the Sudanese regions. In French Equatorial Africa it is met with everywhere.

Trachoma is very rare or non-existent in the coastal and forest regions but frequent in the Sudanese regions. At Dakar and in Senegal it is fairly often seen. In Mauretania, Sudan, Upper Volta, Niger, there is no reliable information. In the Ivory Coast it is absent. Will this immunity persist, the author asks, when this colony is linked by railway with the trachomatous areas to the north ? In Togo trachoma is thought to be less rare than in the above-named areas, but not to be a factor in the blindness which is so common ; no less than 14 per 1,000 are blind in one eye. In Indo-China trachoma is a veritable social plague.

There are several pages on *venereal diseases*. This excerpt must suffice—Lymphogranuloma inguinale, formerly climatic bubo, is very common on the Ivory Coast. It develops generally in three weeks, behaving like an infective disease. *A. G. B.*

VAN CAMPENHOUT. L'assistance médicale aux indigènes du Congo Belge. [**Medical Assistance to Natives of Belgian Congo.**]—*Bull. Office Internat. d'Hyg. Publique.* 1933. Oct. Vol. 25. No. 10. pp. 1789–1792.

In October 1930 a fund called *Foreami* (Fonds Reine Elisabeth pour l'Assistance Médicale aux Indigènes Congo Belge) was instituted for the purpose of combating tropical disease in Belgian Congo. It amounted to 150 million francs and is said to yield an income of 9 million francs. The sector chosen for its work was one in the lower Congo. A report on the first year's activities has recently appeared (see this *Bulletin*, Vol. 30, p. 569).

In connexion with the fund there is a Council and Committee in Belgium with a bureau at Brussels. A Committee in the Congo is presided over by the Governor General. The program includes medical assistance to the natives in its widest acceptation. The medical personnel consists of 10 doctors and 10 white sanitary agents. The rates of pay and pensions are governmental ; the agents of Foreami can pass to Government service and back again. Foreami also has at its disposal the personnel of the Service auxiliaire d'Assistance Médicale Indigene, so that there are in all 15 doctors and 39 white sanitary agents. For 1932 this provision was increased and Foreami has been able to subsidize the measures against sleeping sickness in Ruanda-Urundi and laboratory work on leprosy in Nepoko. In 1933 it was to extend its area of action to the province of Congo-Kasai. When these sectors have been sufficiently sanitated it is intended to transfer the organization to other sectors. *A. G. B.*

KHALIL (M.). **Report on the Mission of the Research Institute, Public Health Department, and the Faculty of Medicine, Cairo, to Siwa Oasis, in January 1933, for the Study of Parasitic Infections, Malaria and Diphtheria.**—21 pp. With 3 figs. and 3 folding maps. 1933. Cairo : Ministry of the Interior, Public Health Department.

The Siwa oasis is in the Libian desert about 600 kilos to the north-west of Cairo ; it is the site of the once famous temple of Jupiter Ammon. About 1,000 people, of Berber origin, dwell there. There are some 200 springs but most of the water is too salt to drink. Ninety-seven children, of 5 to 16 years, were examined for urinary and rectal bilharzia. None was found infected. The stools were examined by both smear and floatation methods ; 96 per cent. had ascaris ova ; no other worm parasites. The inhabitants claim that every Siwan has the " abdominal serpent " (Ascaris). The method of disposal of excreta is by pit, the contents of which are removed at intervals in palm-leaves on donkey-back to fertilize the crops. The product mixed with sand is quite dry, which accounts for the absence of ankylostomes ; ascaris ova are resistant to dryness. Bilharzia is present in Dakhla and Baharia oases, absent in the Siwa and Gara oases. The average amount of salt in these springs is, respectively, 205, 204, 2,330 and 7,074 p.p.m. ; *i.e.*, there is 10 times as much salt in Siwa as in the first two. Bulinus will not live where there is much salt. For the prevention of ascaris it is proposed to treat the inhabitants once a year with oil of chenopodium.

Malaria was once very prevalent in Siwa and preventive measures were started in 1919. Now only three out of 104 had parasites (tertian) in the blood, and only 7 of 167 children had enlarged spleens. Four species of anopheline are found in this and neighbouring oases ; *A. multicolor* is believed to be the main carrier. The disease has been combated by the distribution of Cyprinodon fish in the ponds and water channels, which are kept free from vegetation. *A. G. B.*

HUMANN. Notes sur les pratiques médicales des Kel Hoggar. [**Notes on Medical Practice among the Kel Hoggar.**]—*Arch. Inst. Pasteur d'Algérie.* 1933. Sept. Vol. 11. No. 3. pp. 465–512. With 1 plate. [Refs. in footnotes.]

The author resided two years in the Touareg country, in a mountainous region to the south of the Sahara at about 23°N. latitude. A description of it was recently published by FOLEY, a member of a scientific mission [see this *Bulletin*, Vol. 29, p. 227].

He describes the ideas of medicine possessed by the tribe, their medical and surgical practices and thirdly their diseases as far as he was able to observe them. We are concerned here only with the pathology of this remote people. Malaria is found occasionally. Most cases have been contracted in the Soudan or the oases. Whether the disease is indigenous anywhere in this large territory stretching between the 20th and 25th degrees of latitude, and varying in altitude between 500 and 3,000 metres, is uncertain. Anopheles have been reported from three localities (*A. multicolor*, *A. hispaniola*, *A. costalis*, *A. maculipennis*). Research in three localities discovered no splenic enlargements. A European contracted undulant fever near Tamanrasset : whether this disease is general is unknown. Gonorrhoea is very common amongst the Touaregs ; few escape it ; in its early manifestations it is mild but it leads later to rheumatism and urethral stricture. Syphilis was never seen among the prostitutes though they

were regularly examined, and the congenital disease was rare, but the author considers syphilis to be not infrequent. Skin symptoms predominate over visceral and nervous.

Affections of the joints are very common. Probably they are often sequelae of gonorrhoea, but some cases yield to anti-syphilitic treatment. Pulmonary affections are common but tuberculosis is rare: the former are attributed to the combination of extreme cold (temperatures below zero are not rare) and scanty clothing. It is not an exaggeration, writes the author, to say that the Touareg die of cold.

Neither smallpox or typhus were seen and the latter seems to be unknown. The mode of living, in scattered groups of 5–6 tents, is not favourable to the spread of epidemic diseases. *A. G. B.*

ROUSSE. Notes de géographie médicale sur Tabelbala. [**Diseases of Tabelbala.**]—*Arch. Inst. Pasteur d'Algérie.* 1931. June. Vol. 9. No. 2. pp. 382–398. With 14 figs. on 7 plates & 1 plan.

This is another account of an oasis in the Sahara desert.

Tabelbala lies 140 kilometres to the south-west of Beni Abbés at 29·25°N. and 3·5°E. (of Greenwich). The configuration of the ground is such that its commercial relations have been chiefly with Morocco and the French Soudan. The palmery is some 5 kilometres long and about ½ kilometer wide. The population is about 500. In July and August the average temperature in the houses is 37°, in the winter midday is hot but there is frost at night. Appreciable rain had not fallen in the years 1927–1930.

The people though underfed seem to be robust and resistant to disease. As in the neighbouring oases *malaria* is common but unimportant. In the palmery are wells and pools, the former mostly dry. In both mosquito larvae are found, identified by EDWARDS as *Culex* sp. perhaps *C. sergenti* Theo., and *Anopheles sergenti* Theo. (adults). The splenic index, determined in two ksars, showed 4 out of 30 palpable spleens in one, and 12 out of 41 in the other, or 22·5 per cent. in all.

Tuberculosis appears to be very uncommon; one pulmonary case was seen in a woman who had lived away with Europeans, returned and died after two months. The natives have only rare contacts with Europeans. The cuti-reaction was tested on about 200 persons and the results are tabulated according to age. In one ksar in 85 persons there were five positives all in 25 adults and in another in 133 persons there were 17 positives, all but three among 55 adults; *i.e.*, 10·1 per cent. in all—a very low proportion.

Trachoma is common, 5 out of 30 at one ksar, 16 out of 55 at another. *Venereal disease* is rare.

A list of molluscs and insects collected includes *Limnea palustris* Müller and *Melanopsis Foureaui* Plry and *Phlebotomus papatasii*. [Leishmaniasis is not mentioned.] *A. G. B.*

GILLY (C.). Activité du service d'hygiène de la circonscription de Dakar pendant l'hivernage 1933 (1er juin au 1er décembre). [**Work of the Service d'Hygiène of Dakar District, June to December, 1933.**] —*Bull. Soc. Path. Exot.* 1934. Jan. 10. Vol. 27. No. 1. pp. 87–93.

This cold season was characterized by a recrudescence of both plague and malaria at Dakar and yellow fever at neighbouring places in Senegal.

Plague.—In the first half of June there were only two cases recognized. An epidemic then began, as the table shows.

Month	Human Plague				Total	Deaths	Rat Plague
	Form						
	Bubonic	Secondary pneumonic	Primary pneumonic	Septicaemic			
June ...	24	8	8	6	46	35	6
July ...	13	2	3	2	20	16	9
August ...	5	0	0	0	5	2	1
Sept. ...	3	1	0	1	5	4	1
October ...	3	2	3	3	11	9	4
Nov. ...	8	3	2	3	16	11	5
Total ...	56	16	16	15	103	77	26

All cases bacteriologically confirmed.

Three foci were recognized, one of which was on the outskirts and one in Dakar itself. Investigations led the author to the conclusion that the disease was not spread from man to man ; wherever human plague was detected corpses of rats and mice were found and in most of these the plague bacillus was recognized. There is a persistent focus among the wild rodents in one locality. The author inclines to think that the sand flea, *Synosternus pallidus*, which is very abundant at Dakar, plays a part in the spread of plague, but this has not been demonstrated. Most human cases occurred in wooden huts, the foundations of which, if of cement, were so defective that rats were numerous ; 68 were obtained from one such house serving as a shop. The measures taken are detailed. Treatment consisted in a subcutaneous injection of an ampoule of bacteriophage together with 100 cc. of antiplague serum (50 by a vein and 50 under the skin). The serum is repeated daily till recovery. Of 10 bubonics thus treated two died of secondary pneumonic plague and eight recovered. [The table seems to show that plague is not so fatal here as in other parts of Africa, *e.g.*, the case fatality in Uganda (1931) was 93 per cent.]

Malaria.—A table shows the incidence of malaria of each type during the same six months. There were 1,215 cases, the majority in August, September and October, 776 of subtertian, 406 of tertian and 33 of quartan, and 41 deaths, chiefly among native children. The author describes the antimalarial measures taken by the Service of Hygiene. Numerous wells were covered and others filled in and a swamp was obliterated in the same way.

Yellow fever.—The action taken is described when a case occurred at Dakar in a man coming from a village 50 kilometres away. *A. G. B.*

DE LANGEN (C. D.). De beteekenis van de geographische pathologie voor het rassenprobleem in de geneeskunde. [**The Significance of Geographical Pathology for the Race Problem in Medicine.**]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1933. Aug. 15. Vol. 73. No. 17. pp. 1026–1044.

The ground covered by the author is developed in an interesting manner and raises numerous questions of racial and geographical pathology. In reality race has nothing to do with nationality or the possession of a common language. An interest has been exhibited from very ancient times by the medical profession in this subject of the

real reasons for the difference among human groups, which are distinguished by form and size but above all by colour of skin, hair and eyes. The normal man with the Greeks, as he is with us, was regarded as in a state of equilibrium ; disease is a disturbance of equilibrium and this equilibrium was regarded as based upon a proper admixture of the four humors, blood, slime, yellow and black bile. That special admixture, according to Hippocratic ideas, gave to every man his own peculiar constitution. The evolution of ideas on these lines is worked out by the author in some detail.

In due course he approaches the subject of the distribution of disease. Definite races were noted long ago to be differently affected by metabolic diseases : the Jews by diabetes and obesity, the Anglo-Saxon race by gout. Tropical pathology has for some time been treated as a separate field of investigation. Restriction of the field, however, to the tropics was much too circumscribed and it has been extended in recent years to include geographical pathology. Human beings, for example, over the whole world are separable into four groups according to the agglutinating properties of their red blood cells. In this conception we may almost see the resuscitation of the four-humor theory of Hippocrates. Many diseases have different degrees of prevalence in different parts of the world. Thus we find a comparative absence of gall stones in the Dutch East Indies and among African races. Gastric carcinoma is common in Europe but uncommon in the indigenous population of Java. The case is just the reverse for hepatic cirrhosis and cancer of the liver. Pernicious anaemia is a blood disease of specialized distribution. Sprue, a well known and common tropical affection is, nevertheless, practically not observed among the true inhabitants of the tropics but only among the representatives of other races who have come to live in the tropics. (But see this *Bulletin*, Vol. 29, pp. 3 and 7.) Other diseases receive consideration from this point of view, blackwater fever, angina pectoris, scarlet fever, appendicitis, acute rheumatism, rickets, and so on.

Have not the glands of internal secretion a definite place in the critical appreciation of racial pathology ? We know nowadays that the normal growth, the development of the secondary sex characters and puberty are not only dependent on the internal secretion of the sex glands but that they are also dependent on those of the thyroid, pancreas, suprarenal, hypophysis and epiphysis. The thyroid, from an anthropological point of view, must be regarded as the most important of all these glands, and on this basis the dweller in Eastern Asia belongs to a hypothyroid race (Keith). With underfeeding there results an atrophy of the thyroid gland in animals (McCarrison) and in a few generations rats can be obtained having thyroids of constant low weight. Temperature also has an influence on the thyroid gland. These are but a few of the points dealt with by the author in what he calls a rough sketch of the extent and importance of the medical questions which have a direct or indirect bearing upon racial or geographical pathology.

W. F. Harvey.

Snijders (E. P.). De tropische pathologie als vergelijkende pathologie. [**Tropical Pathology as Comparative Pathology.**]—*Nederl.-Tijdschr. v. Geneesk.* 1933. Dec. 30. Vol. 77. No. 52. pp. 5745–5758. [13 refs.]

Tropical pathology, says the author, is in no way different from the pathology of the temperate zone. It may show, however, a different

incidence, differing frequency and racial discrimination. Thus it may be studied as a branch of comparative pathology. This introduction leads the writer to a discussion of liver cirrhosis, primary liver cancer and the occurrence of gall stones in Javans.

It is very extraordinary that in a population in which the use of alcohol can be excluded as a factor, cirrhosis of the liver should be so common. The mortality from cirrhosis, for example, is about 10 times higher in Javans than in a European population of the same age and sex distribution—43 per 100,000 in Javan males as compared with 4·4 in Holland. Biliary cirrhosis on the other hand is rare and this may possibly be due to the rarity of gall stones. Another disease which is comparatively frequent in the Netherlands Indies is primary liver-cell carcinoma. Figures taken from the records of the central laboratory at Medan, for cancers examined, give 54 per cent. primary liver cancers in Javans, 90 per cent. of which occurred in cirrhotic livers. The association of primary liver cancer with cirrhosis is very high and well recognized in Europe also. We find the question—rightly or wrongly—asked : Why are malignant tumours so rare in the tropics ? In any case the question should be split up into a series and altered to :—Why is the localization of cancer so different in the tropics from that in Europe ? Why is gastric cancer so rare in Javans ? and why is primary liver cancer so common in tropical regions ? Lastly it has been found that gall stones are rare in Java especially in Javanese women under the age of 50. In the autopsy records available only one true solitary cholesterin stone was found and that in a 50-year old Chinese. The great majority of the gall stones found contain little cholesterin, little calcium and abundant bile pigment. The reasons given for these differential distributions of disease are not yet very satisfactory.

W. F. Harvey.

Kolle (W.) & Prigge (R.). Die symptomlose Infektion. [**Infection without Symptoms.**]—*Arb. a.d. Staatsinst. f. Exp. Ther. u. d. Georg Speyer-Hause zu Frankfurt a. M.* 1933. No. 28. 46 pp. [2 pages of refs.]

The subject of this paper, infection without symptoms, raises questions of great importance ; and, if the experimental facts, proved in the case of animals, are of general application, some modification and revision will be necessary of the current views on natural resistance, immunity, carriers and the like.

Drs. Kolle and Prigge include under the term infection all cases in which the causal agent can be found in the tissues or fluids of the body, on the mucous membranes and their accessory cavities, or in secretions and excretions. It will be seen that this definition is a very broad one, and that it would include such cases as cholera contacts, in whose digestive tracts the cholera bacillus grows as in a culture medium, and who discharge vibrios harmless to the carriers themselves, but virulent to others. It is usual to attribute the absence of symptoms in the carriers to a natural immunity that they possess, at any rate temporarily, to infection with cholera ; but the true nature of such an immunity remains unexplained.

The authors have made a very complete experimental study of syphilis in the rabbit and mouse, and the results that they have obtained are of outstanding interest and significance.

About ten years ago, Kolle described how rabbits, which had received an injection of a bismuth salt, and in which an insoluble deposit had formed, failed to react like normal rabbits to a subsequent infection with syphilis; no chancres and no glandular enlargement occurred. Had the presence of the bismuth deposit destroyed the virus, or had infection really occurred, in spite of the absence of symptoms? To settle this point, the bismuth deposits were removed by operation, two to ten months after their formation, and the completeness of the removal was verified by means of X-rays. In a number of animals typical chancres developed about six weeks later, thus proving that infection had certainly occurred, though without any symptoms.

Pearce and Brown (*Jour. Exp. Med.*, Vol. 35, 1932) found that the popliteal lymphatic glands of untreated syphilitic rabbits always contain quantities of *Spirochaeta pallida*, even after the disappearance of obvious symptoms; by the inoculation of such lymphatic tissue into the testicle of normal rabbits, they produced primary syphilomas. Kolle and Evers employed this method with the lymphatic glands of rabbits, which as the result of a previous bismuth injection, had failed to show any symptoms after the inoculation of syphilitic material; in many cases typical chancres developed in the normal rabbits.

The same authors then proceeded to determine whether syphilitic infection without symptoms occurred in animals which had not received therapeutic treatment. In experimental infection of rabbits with syphilis, it is found that, in about ten per cent. of the animals, neither chancres nor any other symptoms occur; such refractory animals are known in German laboratories as "Nuller" (blanks). The authors inoculated normal rabbits with the popliteal glands of these "Nuller," taken 80–200 days after the apparently negative infection; they found that typical chancres nearly always resulted in the normal rabbits. It is evident that the "Nuller" were in fact the subjects of a chronic infection without symptoms. In a few cases where the experiment failed, the normal rabbits, which did not show symptoms after inoculation, were probably themselves "Nuller"; and, indeed in some cases, spirochaetes were actually found in their popliteal glands. Whilst most of the "Nuller" remain permanently free from obvious manifestations of syphilis, occasionally chancres do develop after many months; a fact which confirms the view that the failure of infection in such animals is only an apparent one. It is possible that in man, too, syphilitic infection may occur without symptoms; Kolle and Prigge remark that this would explain the occurrence of tertiary symptoms without any history or evidence of primary symptoms, and the fact that mothers, who have always seemed to be quite healthy, may give birth to syphilitic children.

Albrecht found that rabbits, infected with syphilis without symptoms, can communicate the disease to other rabbits by coitus; the possibility of a similar transference of the disease by human beings, who have shown no symptoms, must be admitted.

Kolle and others have also been able to produce syphilitic infection without symptoms in rats and mice, by the insertion of portions of a chancre under the skin of the back; no chancre is formed, but, after some months, the lymphatic glandular tissue is found to be infective, for rabbits; and the disease can be transmitted from mouse to mouse always without manifest symptoms. Kolle and Evers found that the guineapig, too, becomes infected without symptoms, and its subiliac glands are infective for rabbits.

Some of the most interesting and instructive experiments carried out by the authors were on superinfection in syphilis. When syphilitic rabbits, in which chancres have developed, are inoculated again, some 90 days later, with the same strain of the virus, no new chancres are formed ; but, if a different strain of syphilis is used, chancres appear in about fifty per cent. of the animals ; from this the authors concluded that, in half the animals, some degree of immunity against a heterologous strain of virus is conferred by the original infection. Kolle then sought the answers to two questions, which, as he observes, are of great importance in the pathogenesis of human syphilis :—

(1) Can two different strains of syphilis exist in the body simultaneously ?

(2) Are the animals, in which inoculation of a heterologous strain does not give rise to a chancre, actually immune to the strain ; or is it only an apparent immunity, which, although it prevents chancre formation, permits the establishment of the spirochaetes in the body ; in other words, is it an instance of infection without symptoms ?

As the results of a well-planned series of experiments, it was found that two distinct strains of syphilis can co-exist, in a virulent condition, in the body of the rabbit ; and that the immunity against a heterologous strain is only an immunity to chancre formation and does not prevent a general infection with the new strain.

The subject of superinfection in syphilis was carried a stage further, in order to ascertain whether the immunity of the rabbit to further infection with the same virus is also merely an apparent immunity, or whether it is possible for homologous spirochaetes to establish themselves in the body while the first infection lasts. A number of rabbits with well-developed chancres were treated during the latent period (4–7 months after infection) with small doses of neosalvarsan ; the doses were too small to effect complete sterilization, but adequate to cause healing of the chancres, and to render the lymphatic glands, 66 days after treatment, non-infective for normal rabbits, when inoculated into the testicle, In another series of rabbits, treated as above, a second injection of the homologous strain was given, 31 days after treatment, without any chancres resulting. Thirty-five days later (*i.e.*, 66 days after treatment, the same period as in the controls), the subiliac lymphatic glands of these animals were used to inoculate normal rabbits ; in 5 cases out of 9, the results were positive. The immunity which the rabbits of the second series showed against re-inoculation with the homologous virus, was only sufficient to prevent the formation of chancres, but not sufficient to prevent a secondary infection of the lymphatic system : there was, in fact, a homologous superinfection without symptoms.

It is impossible, within the limits of a review, to do more than refer briefly to a few of the subjects dealt with in this very instructive paper. The authors find that infection without symptoms occurs in many diseases, including many tropical ones ; that this is the case is generally recognized, but, perhaps, sufficient heed has not always been paid to its great practical importance ; and Drs. Kolle and Prigge, by their brilliant work, have brought clarity and precision to, and greatly extended our knowledge of the subject. The original paper will repay the careful attention and study of all who are concerned with the domains of pathology, therapeutics, prophylaxis, epidemiology and hygiene.

H. J. Walton.

Rabl (Rudolf). Geographisch-pathologische Untersuchungen ueber Ikterus, akute gelbe Leberatrophie, Leberzirrhosen und Cholelithiasis. Ein Beitrag zu ihren Ursachen und Krankheitsbeziehungen. [**Geographical and Pathological Investigations of Icterus, Acute Yellow Atrophy, and Cirrhosis of Liver and Cholelithiasis. Their Causes and Relations.**]—*Beihefte z. Arch. f. Schiffs- u. Trop.-Hyg.* 1934. Vol. 38. No. 1. pp. 1–80 (1–80). With 2 figs. [14 pages of refs.]

Dr. Rabl's monograph is a study of the geographical distribution, frequency and morbid anatomy of epidemic jaundice, acute yellow atrophy, cirrhosis of the liver and cholelithiasis. It is based mainly on postmortem examinations made in Russia and in Leipzig, but, where they are available, the records of other countries are also turned to account for purposes of comparison. The Russian statistics are for the years 1917–31, and include all the autopsies on persons above the age of 15, held in large general hospitals throughout the Soviet Union, where the pathologists have the right to perform postmortems on all patients who die in these institutions. About 100,000 Russian postmortems are referred to in one of the tables ; and the area from which they are derived is so vast, extending as it does from the Western European frontier to Irkutsk and Chita in the neighbourhood of Lake Baikal, that the most varied climatic conditions are included in it.

Many deaths from epidemic jaundice are reported from the Soviet Union, and several epidemics were confined to children. At the end of the War, and in the following years, epidemic jaundice showed a marked increase in Germany, and increases are also reported from other European countries and the United States of America.

About 150 cases of acute yellow atrophy are recorded in the Russian post-mortems. In Russia, as in Germany, it is commoner in young people, and especially in women. The cases in Leipzig and the Soviet Union confirm the connexion between acute yellow atrophy and pregnancy, salvarsan treatment and operations, which has often been noted. These conditions are certainly predisposing causes, but not the actual cause. The disease, in Russia, is more common in autumn and winter than at other seasons of the year, but no direct influence of the atmospheric temperature and humidity can be made out ; nor is any definite association shown with gallstones, but antecedent attacks of typhoid and paratyphoid B are recorded with some frequency.

There are considerable variations in the frequency of cirrhosis of the liver in different countries, and even in different towns of the same country. Thus it is rare in Poland, Upsala and Basel ; common in Java, Boston and Stockholm. In Leipzig a finely granular (? monobular) cirrhosis preponderates ; in the Soviet Union a coarsely granular form (? polylobular) is more common. The influence of general nutrition, as a predisposing condition, seems to be decided ; in Germany there was a decrease in the number of cases of cirrhosis during the War, and in most of the Soviet Union during the " hunger years," 1918–22. Climate cannot be considered a potent factor, for the condition is as common at Irkutsk, which has a very cold Siberian climate, as at Tashkent, with a subtropical temperature. Cirrhosis was often associated with cholelithiasis, but whereas cholelithiasis is much commoner in Germany than in Russia, the difference in the frequency of cirrhosis is very slight. There are considerable discrepancies between the observations of different pathologists as to the frequency of a positive Wassermann reaction in cases of cirrhosis ; in

Leipzig, among 146 cases of cirrhosis, the reaction was positive in 13 and doubtful in 5. In the territory of the Soviet Union, cirrhosis is not more common in the malarious districts than in those where malaria does not occur. Inflammatory conditions of the alimentary canal, appendicitis, dysentery and tuberculosis are only rarely found, but some cases of cirrhosis are connected with diseases of the blood-vessels, thrombosis and endophlebitis of the hepatic veins, local and general arteriosclerosis and endocarditis. Abuse of alcohol certainly increases the tendency to cirrhosis, but is not the actual cause of it.

In the Soviet Union, gallstones are decidedly less common than in Germany. In Leningrad the percentage of gallstones in 10,969 post-mortems was 1·7 : in Leipzig, during the same years, in 15,787 post-mortems the percentage was 8·7. The fact that the number of cases of cholelithiasis in Russia diminished decidedly after the years of war and famine, shows the influence of nutrition ; latterly the disease has increased again. The differences in the incidence of gallstones among various races is largely a matter of mode of life and nutrition ; the Jews appear to be especially prone to the disease. The association of gall-stones and enteric fever has often been observed ; and yet in the Soviet Union, where there is much enteric, gallstones are less frequent than in most other countries.

Dr. Rabl's minute and almost exhaustive analysis of such numerous postmortem records shows the value of geographical pathology as a help towards the determination of the main factors in the etiology of diseases. The detailed study of individual cases, valuable as it is, rather tends, by reason of its actual thoroughness, to obscure the relative importance of the various conditions found, the value of which can only be gauged by a large scale survey like the present one. The postmortem reports are often silent on points that it would be of much interest to know, but their collective value is undoubted. Dr. Rabl's paper is full of important facts and comparisons ; the study of it can be strongly recommended to all who are interested in the subjects with which it deals. *H. J. Walton.*

Faust (Ernest Carroll). **The Opportunity for Parasitology in the Medical Schools of the South.**—*Southern Med. Jl.* 1933. Nov. Vol. 26. No. 11. pp. 962–964.

Dr. Faust points out that 20 to 25 per cent. of the patients seen by physicians in the southern U.S.A. harbour animal parasites ; he considers that medical students in that area should have a course in medical parasitology preferably during the first clinical year. They should be in groups of not more than 25 and should be instructed by an adequately trained parasitologist in a properly equipped laboratory. The course should occupy 16 to 20 half days. Such a course is outlined.

A. G. B.

Gilkes (Humphrey A.). **Native Customs in Africa and the Medical Officer.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1933. Nov. 30. Vol. 27. No. 3. pp. 315–320.

This article treats of native customs and beliefs in Northern Rhodesia about menstruation and midwifery, initiation and taboos in respect to food and to infectious diseases. If the medical officer has

not some familiarity with these he cannot be successful. "He will never enjoy the complete confidence of his villagers until he has learned the medical customs of the tribes amongst whom he is working." The paper cannot be summarized but should be read. We may note here that an unsuccessful practitioner is not expected to ask for a fee, however hard he may have worked and however long a time he may have spent over a case. *A. G. B.*

ARCHIVES OF MEDICAL HYDROLOGY. 1934. Jan. Vol. 12. No. 1. pp. 209–220.—**Convalescence from Tropical Diseases, treated by Waters and Baths** [WAGNER (Fritz), PIERRET (Robert), FISCHER (Otto), EDGECOMBE (W.), BYAM (William), CASTRONUOVO (Giovanni)].

Treatment of tropical diseases by alkaline saline waters.—

Dr. Wagner (Carlsbad) said that the chief spas treating the sequelae of tropical diseases or "tropical debility" in Czechoslovakia are Carlsbad, Marienbad and Franzensbad, the waters being mainly of the Glauber's salt type. He classes the cases as (1) chronic constipation, (2) "dietetic traumas," (3) intestinal sequelae of dysentery and malaria, (4) hepatic disorders. The treatment for each class of case is discussed.

Dr. Pierret (La Bourboule) gave the chief French spas for the treatment of tropical diseases as La Bourboule, Brides les Bains, Châtel-Guyon, Plombières, Vichy. A short account is given of each. Vichy is the most important; most of the Colonial patients there suffer from liver disorders: the waters are strongly bicarbonated. For malaria the spa recommended is La Bourboule, the arsenical water of which "undeniably exerts a specific antiparasitic action." The author states that the most important complication of malaria seen, both in numbers and seriousness, is hepatic cirrhosis; Vichy is the spa indicated. It is noted that the famous Plombières rectal douches are now almost abandoned at that spa.

Methods and machinery for treating tropical diseases.—

Dr. Fischer (Tübingen) after reference to specialist diagnoses at Hamburg or Tübingen gives details of the health resorts and spas of Germany; *e.g.*, for anaemia after malaria or ankylostomiasis he suggests a spa with arsenical or chalybeate waters, such as Dürkheim, Homburg and Elster. He gives some space to social provision. Seamen insured in an approved society called the *Seekrankenkasse* are eligible for free treatment at German spas for tropical diseases, all of which are scheduled as diseases of occupation under Workmen's Compensation legislation. The insurance societies have established hostels at several spas.

Dr. Edgecombe (Harrogate) describes the objectives of spa treatment and gives the main characteristics of the British spas to which tropical convalescents may be sent, viz., Bath, Buxton, Bridge of Allan, Cheltenham, Droitwich, Harrogate, Leamington, Llandrindod and Strathpeffer.

Dr. Byam (London) [whose article is the most useful of the bunch] drew attention to the fact that many tropical convalescents pass to regions on the coast where the climate is relaxing when they should go to more bracing spots and upland airs away from the sea. To make a suitable spa a success for the purpose of the tropical invalid there are three essentials—a practitioner with special knowledge of tropical parasites to act as pathologist, a well-equipped laboratory and a dietetic

centre, *i.e.*, an establishment which has the amenities of a hotel combined with the supervision of a nursing home.

The article on Italian spas is contributed by Dr. Castronuovo.

A. G. B.

Connell (W. K.) & Buchanan (J. C. R.). **Ulcers in the African Native. A Preliminary Investigation.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1933. Nov. 30. Vol. 27. No. 3. pp. 239–254. With 2 diagrams.

A careful survey of ulcers in 138 natives of Zanzibar, with a system of mensuration and recording of results, a comparison of various treatments and some remarks on etiology.

The authors sought a safe ambulatory treatment generally applicable to ulcers and capable of easy application; surgical excision followed by grafting is therefore not considered. Their aim was to establish a standard of comparison for future work. Of the 138 persons 92 per cent. were males and 79 per cent. were between 10 and 30. Well remunerated classes were not represented; indeed 36 per cent. were unemployed. Many, however, were apparently in robust health. Twelve methods of treatment were employed for the 256 ulcers studied, but 56 of these were advanced in healing. Those most deserving of mention were plaster of Paris and zinc ointment, plaster of Paris and "Zipp" (Bipp with zinc ointment substituted for bismuth subnitrate), the same with specific drugs, White Robertson's wax; moist antiseptic dressings renewed daily were employed as a control for other methods. The authors came to the conclusion that the best treatment for the vast majority of ulcers was to "lock them up" inside a rigid, tight-fitting case. This does not interfere with the patient's work and provides for the development of local immunity and the protection of newly-formed epithelium; zipp with or without spirochaeticides was the most successful application. There is no smell and no excessive discharge. [The authors state that they had no failures with 53 cases treated with zipp and spirochaeticides; their table shows 67 treated and 14 untraced.] When the healing stage has been reached zipp may give place to White Robertson's wax which proved "the most effective application for promoting the rapid epithelization of healing-stage ulcers." They note here that no ulcer was described as healed unless it was completely epithelized.

Most methods of measurement of ulcers fail because of their great irregularity in shape. They used two and recommend the second.

"This is based on the calculation of the average rate of advance of the epithelium from the time treatment is started until healing is complete, and for the purpose of ready comparison this is reduced to, and recorded in, millimetres *per diem*. The area is estimated as in the first method by reproducing the ulcer on squared paper, and the length of the perimeter is then easily measured with an opisometer. Now, if the area of an ulcer is reduced to a hypothetical rectangle with a base equal to the length of the perimeter, the shorter side must represent the total advance of epithelium necessary to complete the healing, and this is obviously calculated by dividing the area by the perimeter. That figure divided by the number of days the ulcer took to heal will give the average daily advance."

An illustrative table and diagram are given.

The authors attribute the prevalence of ulcers among the badly remunerated classes to the unvaried and ill-balanced nature of their

diets, producing an " ulcer diathesis," and the comparative absence of females among the patients also to a dietetic cause, the African female's diet differing in certain essentials from that of the male ; they do not admit that the less exposure to trauma will explain the difference. They note that these ulcers are clearly distinct from varicose ulcers, dependent on venous stasis ; indeed in 45 per cent. the affected leg was definitely the smaller. The results of the Wassermann and Kahn tests showed that only in 39 per cent. could yaws or syphilis be ruled out but in their judgment this has little significance in the pathology of true tropical ulcer. From the statements of the patients it was concluded that half began with an injury and half did not. A diagram illustrates the sites of the leg ulcers ; 76 per cent. affected the foot, heel, ankle and lower third of leg. Skin overlying bulky muscles was practically free. They believe that the skin areas least subject to ulceration are those which are best supplied with arterial blood.

Appendices to this useful paper include tables of ulcer characteristics and other data, a comparison of rates of healing and formulae of preparations used in treatment. *A. G. B.*

BRUMMELKAMP (R.). Over de therapie van het ulcus tropicum acutum. [**Treatment of Acute Tropical Ulcer.**]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1933. Oct. 24. Vol. 73. No. 22. pp. 1346–1351.

——. De behandeling van chronische zweren met permanente warmte. [**Treatment of Chronic Ulcers with Permanent Heat.**]—*Ibid.* pp. 1352–1356. With 10 figs. & 1 chart on 6 plates.

In the first of these two communications the author shows how time may be saved in the healing of acute ulcers by the adoption of vigorous measures.

The non-surgical method consisted in the use of a bath of warm water, 1/5,000 pot. permanganate and soda water. The bath was used once or twice a day for an hour ; the pot. permanganate acted both as disinfectant and deodorant, while the soda water acted by loosening detritus and so cleansing the ulcer surface. With these methods 3 per cent. boric lotion compresses were combined and for this purpose wood wool was advantageously used. They were changed every 3 hours. A surgical cleansing was even more effective and was carried out under ethyl chloride anaesthesia. After removal of the surface and edges, the ulcer was well packed with iodoform gauze. On the following day the bandage was removed with the help of peroxide of hydrogen and a boric vaseline dressing applied. A healthy granulation tissue should develop in 1½ to 2 weeks. Healing may be greatly accelerated by Thiersch grafting. The total number of ulcers treated were 333 acute and 86 chronic Of these 52 acute ulcers received epithelial transplants and 47, or 90 per cent., were successful.

In the second communication there is described the use of continuous heat as an accelerator of healing for the chronic ulcer, which so frequently succeeds the tropical ulcer.

This type of ulcer, with its pale grey flabby granulations, its stinking, sloughing, phagaedenic surface, offers the greatest resistance to treatment. It is poor in blood supply, for its blood vessels have been strangled by excessive growth of fibrous tissue. It is to stimulate the access of blood to the part that the author has elaborated a method of applying continuous heat. An electric apparatus is used capable of exact regulation and the temperature is kept at 42°C. An ulcer which

had resisted treatment for 9 months was healed in 28 days. Others were healed by this thermophoric treatment in 3 weeks, 16 days, 18 days and 25 days, and had previously been treated unsuccessfully for 3 months, 7 months, 4 months and 1½ months respectively. It would seem, therefore, that there is considerable justification for the use of this or a similar method of treatment. *W. F. Harvey*

BLACKABY (E. J.). **Notes on the Treatment of Tropical Ulcer.**—*Ann. Med. Rep. on Health & Sanitary Condition of Nyasaland Protectorate for Year ending 31st December, 1932.* Appendix II. pp. 61–62.

Successful treatment of 15 cases of tropical ulcer by merely strapping. The author followed the method described by SAYERS [this *Bulletin*, Vol. 30, p. 36]. The ulcers, of one–fifteen years duration, all healed in 6 weeks or less ; one involved two-thirds of the circumference of the leg above the angle.

"The ulcer is washed with saline, dried, and zinc-oxide strapping applied tightly twice round the foot and ankle in a figure of eight. It is then continued spirally round the limb with no reverses as far as the knee. By holding the spool in one hand, the difficulty of controlling the strapping ensures a tight application. No lint, gauze, antiseptic, or dressing of any kind is applied to the ulcer, the surface of which lies in contact with the sticky surface of the strapping. After three days or so, discharge soaks through to the surface and is removed by a moistened piece of cloth."

The author suggests elastoplast as preferable to strapping. The strapping is reapplied after 14 days. The patients continue their work, making in all three attendances. As to the rationale a rise of temperature in one patient retained in hospital suggested to his mind that the retained toxins may stimulate antibody formation. He thinks too there may be retention of bacteriophage in contact with the ulcerated surface. The advantages of the method are too obvious to state.

A. G. B.

MCGUIRE (Christie). **Treatment of Tropical Phagedaenic Ulcer.**—[Memoranda.]—*Brit. Med. Jl.* 1933. Nov. 18. pp. 918–919.

This treatment consists in the thorough swabbing of the ulcer twice daily with a copper sulphate carbolic acid solution, followed by dusting with iodoform and bismuth subgallate powder. It has been used in tea-gardens for two years on over 2,000 cases of tropical ulcer.

"In making up the solution it is essential that the copper sulphate be completely dissolved in distilled water, leaving no deposit ; this can only be achieved in a mortar. The carbolic acid is then added, the composition of the solution being copper sulphate ℥iij, distilled water ℥j, and carbolic acid ℥j. As the carbolic acid rises to the top of the solution the latter must be shaken before use on each case. The purpose of the carbolic acid is to deaden the pain of the copper sulphate and allow thorough swabbing of the ulcer and removal of slough. After swabbing, the following powder should be applied and the ulcer covered with a piece of lint and a bandage : iodoform, 1 part ; bismuth subgallate, 3 parts."

Pain and slough disappear in about 4 days and an average sized ulcer heals in two weeks. Treatment is painless. Swabbing is continued till healing is complete. In iodoform sensitive cases calomel is substituted. *A. G. B.*

Blondin (P.) & Riou (M.). Contribution au traitement de l'ulcère tropical. [**Treatment of Tropical Ulcer.**]—*Bull. Soc. Path. Exot.* 1933. Dec. 13. Vol. 26. No. 10. pp. 1280–1284. With 1 fig.

Riou (M.). Nouvelle technique de pansement des greffes épidermiques ; son application au traitement des ulcères de jambe. [**New Technique for Treatment of Epidermal Grafts.**]—*Ibid.* pp. 1296–1301. With 2 figs.

i. The authors discuss the characters and treatment of phagedaenic ulcer. They describe the exudate which covers the ulcer ; whatever the local treatment this exudate must be cleared away. For this purpose they employ a modification of the Carrel-Dakin method, in which fluid is dripped on the ulcer from a height of about 75 cm., chlorinated soda or 30 per cent. peroxide of hydrogen, 30 to 40 drops a minute. The first seance lasts 3–4 hours, succeeding ones, preferably night and morning, a shorter time, the strength of the dilution being reduced. In 2–4 days the base becomes healthy. Between times Pons's anti-phagedaenic lipo-vaccine is applied under moist and impermeable dressings. They have experience of some 400 cases.

ii. Here Riou is dealing with chronic ulcers from various causes. The appropriate aetiological treatment is given and the ulcer cleansed. The grafts are taken by Reverdin's method. Pons's lipo-vaccine is applied to the grafted surface, a compress of two or three layers a little larger than the ulcer and soaked in lipo-vaccine. This is covered with a thin layer of absorbent wool well wrung out of boiling water, which makes the compress adhere to all parts of the ulcer and the whole is covered with impermeable paper dipped in a mixture of lead salts, wax and turpentine with a basis of linseed oil. This adheres to the skin around the ulcer and prevents any displacement of the grafts. The whole is kept in place with cotton wool and a bandage. The outer dressings are removed daily, the compress being kept wet with the lipo-vaccine. This is only removed after a week and then every 3–4 days. The patient must stay in bed for 8–10 days. *A. G. B.*

Moreau (P.). Note au sujet de cinq cas d'ulcères de nature vraisemblablement mycosique constatés à la Guyane. [**Five Cases of Ulcer probably Mycotic in French Guiana.**]—*Bull. Soc. Path. Exot.* 1933. Oct. 11. Vol. 26. No. 8. pp. 976–978.

These ulcers were seen on convicts engaged in cutting and squaring timber in the forest in French Guiana. They occurred chiefly on the lower limbs, started as itching pimples, and were followed in two instances by small nodules under the skin, one of which broke down and gave issue to a glairy sero-pus. No satisfactory laboratory examination could be made, but the lesions yielded to full doses of iodide of potassium. They were regarded therefore as mycotic and a previous case of sporotrichosis from the forest country is mentioned.

A. G. B.

Huisman (R. G. J. P.) & Müller (H.). Dermatitis ulcerovegetans (gyrata). [**Dermatitis ulcero-vegetans (gyrata).**]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1933. Aug. 1. Vol. 73. No. 16. pp. 985–991. With 5 figs. (4 on 2 plates). English summary (2 lines).

The authors, although aware of the tendency in dermatology to create new and somewhat artificial diseases, feel justified on clinical and

therapeutic grounds in differentiating the ulcers here described from the well-known chronic tropical ulcer. Six cases were met with out of 723 ulcer patients in which chronic ulcers, solitary or multiple, were situated on legs or arms, showed concentric arrangement, were broken up like islands or peninsulas in the zone around the cicatricial centre and occurred in persons of upwards of fifty years of age.

The term "vegetative" is applied to this dermatitis because, besides ulceration, there is also hypertrophy of the epidermis manifested macroscopically by the "island and peninsula" appearance and microscopically by acanthosis and increase in depth of the stratum granulosum. There was no evidence of syphilis or yaws to account for the lesion, which appeared to be a chronic streptococcal affection. Microscopically the condition was essentially ulcerative and inflammatory, had nothing to show of malignancy and was characterized by great breaking up of the epidermis which had long strands extending into the cutis, disappearance of elastic tissue, acanthosis, parakeratosis and hyperkeratosis, and an inflammatory cell reaction of polymorph, round cell and giant cell type. Therapeutically the ulceration yielded to the application of a 5–10 per cent. salicylic acid ointment instead of the more usually employed 1–2 per cent. Photographs are given of the clinical condition and the pathological anatomy. *W. F. Harvey.*

Hughes (T. A.). **Observations on Cirrhosis of the Liver as seen in the Punjab.**—*Indian Jl. Med. Res.* 1933. Oct. Vol. 21. No. 2. pp. 353–360. [19 refs.]

An article bringing further evidence that malaria and cirrhosis of liver are causally connected.

The author, together with Shrivastava, six years ago expressed the opinion that malaria played an important part in setting up hepatic cirrhosis (see this *Bulletin,* Vol. 25, p. 395). He has observed another 30 cases clinically and carried out autopsies on two of them; these form the basis of the present article.

Cirrhosis of the liver seems to be fairly common in Northern India for 3 per cent. of the total 7,911 admissions to the medical wards of the Mayo Hospital, Lahore, were on this account. Both the clinical and the histological pictures are those of a polylobular cirrhosis. The spleen may be large and "beefy" or shrunken and fibrotic; pigments, blood-derived and malarial, are frequently seen.

Certain biochemical features are described. Bilirubinaemia is common, giving an indirect van den Bergh reaction varying from one to four units. In eight of the patients (three of whom presented oedema of the legs) the blood proteins were estimated. The albumin/globulin ratio varied from 1·4 to 0·53, or below normal in all. Seeing that the serum albumen was also subnormal, the author concludes that the oedema of the legs in hepatic cirrhosis is due to hypoprotinaemia as well as, if not more than, the pressure on the intra-abdominal veins and failure of the compensatory circulation.

The spleen, judged by results of the adrenalin test, seemed to have lost its contractility, or to have it much reduced. The leucocyte increase did not run parallel with the erythrocyte numbers and is probably due to influx from the lymphatic glands.

The clinical features are typical and need not be detailed. In the discussion regarding aetiology, Colonel Hughes considers other causes of cirrhosis -alcohol, syphilis, helminthiasis, amoebiasis, and diet—and partly by exclusion and negative evidence, partly by positive, the

pre-existence of malaria [an argument of doubtful value where malarial infection is common, apart from cirrhosis of liver] and the narration of a case in which the change was observed from chronic malaria with enlarged spleen and liver to cirrhosis of liver with ascites—comes to a conclusion confirmatory of his former opinion regarding malaria as a cause of cirrhosis. [The subject is interesting and a difficult one, and much work yet remains to be done before it can be taken as proved that in a country where malaria is practically ubiquitous and cirrhosis of liver is " rather common " the latter is connected with the former as effect to cause.] *H. H. S.*

RADHAKRISHNA RAO (M. V.). **An Investigation into " Decompensated Portal Cirrhosis."**—*Indian Jl. Med. Res.* 1933. Oct. Vol. 21. No. 2. pp. 389–416. With 3 figs. on 1 plate. [45 refs.]

This article may be regarded as complementary to the above and should be read and studied in connexion with it.

Sixty-four cases of portal obstruction with ascites, due to hepatic cirrhosis, admitted into the medical wards of the King George Hospital, Vizagapatam, are the subject of study. Protocols accompanying the article show that the condition is commonest among the poor and lower middle class Hindus, affects males more than females, usually between 20 and 50 years of age (6 were children), ryots (cultivators) by occupation.

Very few took alcohol to any extent ; the diet of those affected differed in no way from that of others of the same class and caste.

Duration and course of the disease were difficult to determine since the majority of patients make but a short stay in hospital and cannot be followed up. The duration of life after the onset of ascites was ascertained in 14 fatal cases ; one was less than one month, and only two lived for twelve months. Prognosis generally was bad, partly at least owing to the fact that the disease was usually in an advanced stage when admission was applied for, and partly because the stay in hospital was too brief for any but palliative treatment as a rule. The pathological findings were those of polylobular cirrhosis histologically ; laboratory examinations showed the blood to be that of a secondary anaemia (*e.g.*, r.b.c. 2,400,000, leucocytes 2,688 per cmm., Hb. 45 per cent., C.I. 0·9) ; van den Bergh positive indirect or delayed direct was obtained in most. Many gave serological agglutination of one or other of the *Bact. dysenteriae*, even though no history of dysentery was obtained ; 41 out of 55 patients gave a positive W.R., 28 of them strongly positive. The therapeutic use of arsenicals in the treatment of syphilis, it may be noted, may itself be a potent factor in causing portal cirrhosis.

Dr. Rao, quoting ROLLESTON and MCNEE, stresses the difficulty of determining between cirrhosis caused by malaria and cirrhosis in a malarial patient. It must be remembered too that such eminent authorities as OSLER, ROGERS and FAIRLEY are all opposed to the idea of advanced cirrhosis being due to malaria.

The diet in most patients was deficient in proteins, fats and vitamins, with excessive consumption of chillies or spices. Oral sepsis and " intestinal intoxication " were common to most of the patients, and the author points out the need for further investigation as to whether, and if so to what extent, focal infections or toxi-infectious processes

may play a part. As already stated field-workers showed a high incidence, and the same has been reported from Lucknow, while " farmers' cirrhosis " is reported in North China.

The author concludes : " Congenital syphilis and primary splenic anaemia were shown to be the chief aetiological factors in a few cases. The exact causation in the rest is far from clear, but it is pointed out that malaria, syphilis, dietetic errors and focal infections appear to be important aetiological factors. It is suggested that further investigation into the exact rôle of dietetic errors and focal infections may prove that the main type of the disease is probably of the nature of ' toxic cirrhosis '." *H. H. S.*

LAHIRI (Subodh Chandra). **Clinical and Experimental Investigation into the Aetiology of the Infantile Cirrhosis of the Liver.**—*Calcutta Med. Jl.* 1933. June. Vol. 27. No. 12. pp. 439–460 ; July & Aug. Vol. 28. Nos. 1 & 2. pp. 22–37 ; 57–97. With 4 plates & 4 charts. [80 refs.]

The author reviews the various theories that have been put forward of the etiology of infantile biliary cirrhosis. He experimented with rats in the National Medical Institute, Calcutta, and records his observations at considerable length. He reports 16 consecutive cases in infants, and tabulates the chief symptoms, results of cultures made from the urine, food given, etc., and reaches conclusions some of which are reproduced :—

" Sixteen consecutive cases presenting typical clinical pictures of infantile cirrhosis of the liver have been recorded here. On culturing the urine in these cases, 7 cases showed B. Coli ; 6 cases showed streptococci and one case showed on one occasion B. Coli, and during a recrudescence of the disease, streptococci. In two cases the urine was sterile, in one of which blood culture showed haemolytic type of streptococci.

" Some sort of chronic gastro-intestinal disorder was present in all the cases. Gross dietetic errors were noticed in only a small number, but a history of irregular feeding was present in all ; and this is unfortunately very common in Bengali households.

" Malaria, kala-azar, syphilis, tuberculosis, rickets and alcoholism could be excluded in all the cases.

" Three cases ended fatally . . . 4 cases, which were fairly advanced, were cured by vaccine injections when other measures failed. Rest of the cases were seen in rather early stages and responded to hygienic measures together with medicinal treatment, or change of places."

" *Conclusion.*—For the production of infantile hypertrophic biliary cirrhosis two factors seem to be necessary ; first, the damage and devitalisation of the hepatic cells, and next, a slow infection, in most cases, with either B. Coli or streptococci.

" Normally, micro-organisms are being constantly carried away from the intestines and are being killed in the mesenteric nodes and the liver. In devitalised condition of the intestinal epithelium a greater number of bacteria will reach the liver, and cause a greater wear and tear of the liver cells. In cases where the hepatic cells have already been devitalised by long-continued dietetic errors or have been specially predisposed by heredity, or some other cause, they can no longer withstand the constant invasion of the intestinal micro-organisms. The colon bacilli, or streptococci, on gaining entrance into the liver, may now destroy the already damaged liver cells, and, at the same time, stimulate the connective tissue cells to increased growth, or what is more likely following the destruction of the more highly differentiated hepatic cells in unfavourable

circumstances, there occurs a replacement of these by fibrous tissue, though in favourable circumstances there might have been regeneration of the hepatic cells and 'restitutio ad integrum.'" *A. G. B.*

HULSHOFF (A. A.). Melioidosis. [**Melioidosis.**]—*Nederl. Tijdschr. v. Geneesk.* 1933. Dec. 16. Vol. 77. No. 50. pp. 5638–5645.

A description is given by the author of the beginning, the ups and downs of the prolonged illness, the mistaken diagnosis and the final diagnosis of a case of chronic melioidosis.

At the outset there was high temperature and for 1½ years a septic intermittent and remittent fever. Lung symptoms were a prominent feature, as also were a prostatic abscess and subcutaneous abscesses. The diagnoses considered were glanders, syphilis, tuberculosis and sporotrichosis and the correct finding was obtained by the cultivation of *Bact. whitmori.* The case forms the subject of discussion. Melioidosis may present itself as (1) an acute sepsis in which form it can be mistaken for malaria, plague or cholera; (2) a subacute septicaemia with a resemblance to malaria, tuberculosis, bronchopneumonia, endocarditis, or again with the development of abscesses in liver, lung, prostate or testicle; (3) a chronic form, suggesting tubercle or syphilis with obstinate subcutaneous abscesses and bone abscesses. Altogether about 70 cases have been described of which 10 were diagnosed during life. *W. F. Harvey.*

HULSHOFF (A. A.). Een geval van melioïdosis. [**A Case of Melioidosis.**]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1933. Sept. 26. Vol. 73. No. 20. pp. 1218–1222.

The case described was one contracted in French Indo-China and was noteworthy for its chronicity and ultimate recovery. Symptoms, which may be summarized as intermittent and remittent fever, lung symptoms, prostatic and subcutaneous painful abscesses and hepatitis lasted for one and a-half years. Various possibilities, such as syphilis, tuberculosis, pneumonia, typhoid fever, a mycosis, sporotrichosis and sepsis were considered, before the isolation of *Bact. whitmori* from the pus obtained by puncture of an abscess established the diagnosis. Treatment, which was ultimately successful, took the form of administration of iodine and mercury. *W. F. Harvey.*

WILLIAMS (Cicely D.). **A Nutritional Disease of Childhood associated with a Maize Diet.**—*Arch. Dis. in Childhood.* 1933. Dec. Vol. 8. No. 48. pp. 423–433. With 7 figs. [Summary appears also in *Bulletin of Hygiene.*]

A well-marked syndrome, occurring in the Gold Coast Colony in children of both sexes of from 1 to 4 years of age, is described. The disease takes from 4 to 12 months to develop fully and there is always a history of deficient breast-feeding with supplementary feeding with maize products (known as arkasa and kenki) only. The skin lesions are characteristic, beginning as thickened dark patches on the ankles, knees, above the wrists and on the elbows. These patches strip off leaving a raw, pink area. There may be a slight oedema of the extremities; the mucous membranes are often ulcerated and in the late stages corneal ulcers are often present. The nervous system shows marked irritability but the reflexes are normal. The temperature is irregular,

the pulse rapid but there is no leucocytosis and no marked anaemia. There are no parasites in the blood, except where there is associated malaria. Vomiting is common and diarrhoea persistent in the later stages and wasting may be severe. The stools show undigested food but no ova or parasites. The liver and spleen may be enlarged. Post-mortem shows nothing definite except a very fatty, almost diffluent, liver and there may be some kidney degeneration. The disease can be readily distinguished from pink disease, pellagra, beriberi and pemphigus.

The cause is not known but is presumed to be dietetic. The patients were treated with an adequate diet, rich in vitamins, and in the early stages of the disease recovery took place, but those seen late died in spite of treatment. The most likely deficiency appears to be in some factor of breast milk or an amino-acid deficiency as maize was the only supplementary food. There was no clinical evidence pointing to lack of vitamins A, C, D or E but a deficiency of some part of the vitamin B complex cannot be excluded. The impression was gained that the most important elements in the dietetic treatment adopted were cod liver oil and a good brand of tinned milk. *H. N. H. Green.*

Nicholls (Lucius). **Phrynoderma : a Condition due to Vitamin Deficiency.**—*Indian Med. Gaz.* 1933. Dec. Vol. 68. No. 12. pp. 681–687. With 4 figs. [Summary appears also in *Bulletin of Hygiene.*]

A very high sickness and high death rate (40 per 1,000) was noted in the inmates of a Ceylon prison. Investigation showed that most of the deaths were ascribed to dysentery but it was found that most of the sick prisoners showed one or more of the following signs :—skin eruption, neuritis and diarrhoea. It was found in most cases that the disease took the following form :—it commenced as a papular dry skin, with subjective symptoms of mild neuritis, gradual loss of weight and, later, diarrhoea or dysentery started, usually becoming very acute. There was low pyrexia (up to 101°F.). The skin eruption and neuritis became more marked and in two-thirds of the cases eye symptoms, of commencing keratomalacia, occurred. Some died a few days after the onset of dysentery, but in most diarrhoea became chronic, with intervals with normal stools. In the last stages emaciation was extreme, the skin very dry, advanced xerophthalmia or keratomalacia was present, and in a few cases, dementia. Most died ; some, when apparently recovering, died suddenly. In two post-mortems acute dysentery was found in one, nothing characteristic in the other. Most cases occurred in those who had been in prison not more than 18 months. During this period a diet with the following constitution was given :—bread, 4 oz., rice, 18 oz., fish, 2½ oz., plantain, 2 oz., vegetables, 2 oz., dhall, 2 oz., jaggery (palm sugar), ½ oz., coconut, ½, lime, ½, onions, ½ oz., chillies, 2, pepper, 1/10 oz., salt, ¾ oz. The diet is obviously very deficient in fat-soluble vitamins and possibly in vitamin B_2. After the first year beef or liver (2 oz. daily) is added to this diet, and this may account for the decline in the incidence of this disease after 18 months imprisonment. The author cannot find any reference in the literature to a disease with this combination of symptoms and proposes to name it phrynoderma (toad-skin). It is due to vitamin A deficiency but other food factors may be at fault.

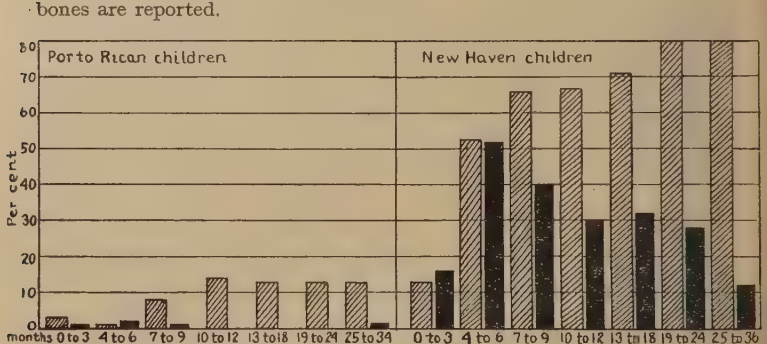
[No proof is given by prophylactic or curative methods that the disease is due to a vitamin deficiency, though it is quite obvious that the eye symptoms were due to a vitamin A deficiency, and it is quite probable from the experimental pathological facts of this deficiency disease that the neuritis, loss in weight and diarrhoea were due to this cause also. The skin eruption has been shown by other workers to be typical of vitamin A deficiency in man. Along with other recent clinical records the present one emphasizes the frequency and importance of this deficiency disease in tropical countries.]

H. N. H. Green.

Eliot (Martha M.) & Jackson (Edith B.). **Bone Development of Infants and Young Children in Puerto Rico. Roentgenographic and Clinical Study, with Special Reference to Rickets, Osteoporosis and Transverse Lines in Radius and Ulna.**—*Amer. Jl. Dis. Children.* 1933. Dec. Vol. 46. No. 6. pp. 1237–1262. With 8 figs. [18 refs.]

Rickets is a rare disease in most parts of the tropics. This paper contains a careful comparison of a series of infants in Porto Rico and a similar series in Connecticut, in which the diagnosis was made by both clinical and X-ray methods. The following is extracted from the authors' summary.

"A study of 584 Puerto Rican children from 1 to 34 months of age was made in order to observe the roentgenographic appearance of the bones of infants living under the influence of tropical sunlight and to make a comparison between the roentgenographic appearance of the bones of such infants and that of the bones of infants living in a temperate climate, i.e., New Haven, Conn. Detailed studies of growth and of the incidence of rickets, of osteoporosis and of transverse lines in the long bones are reported.



Clinical and roentgenographic evidence of rickets at specified age periods in 584 Porto Rican children and in 956 New Haven children who had been given no specific treatment to prevent rickets. The diagonal lines represent clinical diagnosis; the solid black space, roentgen diagnosis.

[Reproduced from the *American Journal of Diseases of Children.*]

" Rickets is undoubtedly a rare disease in Puerto Rico. By roentgenographic examination only 5 cases of rickets were detected (less than 1 per cent. of the total). One was a case of frank severe rickets, that of a 7 month old infant who had lived all of his life in a stone cellar lighted only with electric light, and another, a case of healed rickets that had occurred when the child lived in New York City. Only 3 infants showed

changes in the bones comparable to those found commonly in New Haven and interpreted there as evidences of very slight or slight rickets. The almost complete absence in Puerto Rico of these slight deviations from the normal lends great weight to the opinion that they are in reality the earliest evidences of rickets, and that the interpretation placed on them in New Haven was correct. Since during the first six months of life (the period when these changes were most commonly found in New Haven) the rate of growth in weight and height of the Puerto Rican children paralleled closely that of children of continental United States, though at a slightly lower level, it is not likely that slower growth of the Puerto Rican children accounted for the absence in Puerto Rico of these deviations from the normal. It is believed that their absence in Puerto Rico may be attributed primarily to the protective influence of the sunlight and their presence in New Haven to inadequate protection by sunlight or by food containing vitamin D." *A. G. B.*

Vampré (E.). Le " mal de engasgo " et son traitement chirurgical. [**" Mal de Engasgo " and its Surgical Treatment.**]—*Rev. Sud.-Américaine de Méd. et de Chirurg.* 1933. July. Vol. 4. No. 7. pp. 493–518. With 16 figs.

Mal de Engasgo or choking disease has long been known in Brazil and papers on this subject have from time to time been summarized in this *Bulletin* [*e.g.*, Vol. 18, p. 301 ; Vol. 24, p. 830.]

It is reported with great frequency from the dry regions of the States of Bahia, Pernambuco and Piauhy but is now rare in S. Paulo State. It occurs at all ages but more usually between 20 and 30 years. Once acquired it is progressive but the spasm is intermittent. It is commoner in men than in women and may be seen in several members of a family. The onset is sudden or gradual. The difficulty of deglutition is progressive. Liquids are taken better than solids. Pain is infrequent. The author finds that the obstruction is in the last phase of swallowing, in the cardia ; there is no spasm of the oesophagus. The cardia is defined as a canal which extends from the oesophageal gap in the diaphragm to the opening into the stomach and even a little beyond. At operation the narrowed portion of the oesophagus which is the size of a lead pencil measures 4–5 centimetres. The oesophagus under X-rays has the appearance of a large purse or pocket in which the food accumulates. The condition is due to a spasm of the cardia producing dilatation of the gullet. It is suggested that it is parasitic in origin ; there are changes in the nervous system which have not yet been studied. The impression of all who have taken part in operations on the disease is that of a chronic inflammatory process round the cardia ; one author has called it " chronic juxta-diaphragmatic perioesophagitis." It can be cured by Heller's operation, which is described at length and consists in laparotomy and resection of the muscular fibres of the cardia along two longitudinal lines without opening the oesophageal or gastric mucosa. Several radiographs are given and a case is described. *A. G. B.*

Kröber (F.). Ueber ein eigenartiges Krankheitsbild bei afrikanischen Eingeborenen am Viktoriasee. [**A Peculiar Form of Disease in African Natives on the Victoria Nyanza.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1933. Nov. Vol. 37. No. 11. pp. 484–496. With 13 figs. [20 refs.]

The author reports a disease of the bladder with fistulas and tumours, small and elephantoid, of that region, not bilharzial, in African natives

attending a mission hospital to the west of Lake Victoria, Tanganyika Territory.

In 4½ years he has seen 500 cases. Men are chiefly affected—always in the uro-genital system. The first symptoms are urethritis and cystitis, scalding on micturition with frequently blood at the end of the act and purulent discharge. Later come strictures in any part of the urethra, then infiltrations of urine, abscesses and fistulas which open in perineum, buttocks or scrotum. Tumours form at the fistulous openings, hard and irregular. The penis and scrotum become implicated ; the scrotum may become enlarged to the size of a man's head (a photograph shows what appears to be a large elephantoid scrotum projecting between the legs behind). The urethra may be completely destroyed. In women the fistulas open on the perineum, labia or vagina ; urethral stricture is unusual. At postmortem or operation the bladder is found to be inflamed, contracted, with wall thickened and ulcerated within. The urine is purulent and offensive with much cell detritus. No tumours have been seen in the bladder. The process extends to the ureters and pelves of the kidney, suppuration in which is the beginning of the end. Regular examinations of the bowel have failed to show any implication of that viscus.

All this suggests schistosomiasis but schistosome eggs have never been found in the urine ; very early cases of the disease, however, are rarely seen. The natives say that the condition begins between the 20th and 25th year and lasts into the 5th decade [? 25 years duration]. A cystoscope was not available till the last few months. By its use in severe cases the bladder is found to have a very small capacity, there is trabecular formation with ulcers in the recesses and almost the whole mucous membrane is affected. The typical appearance of schistosomiasis (according to numerous writers)—sand grain layer, vesicle formation on the mucosa, papillomata—are wanting.

As above stated, schistosoma eggs were repeatedly looked for in the urine. The only instances in which they were found were in persons from a distance who were not suffering from the disease in question. The author has examined much material obtained both at operation and at autopsy, at Tübingen and in the Hamburg Tropical Institute without elucidating the cause of the condition ; though schistosome eggs were never found the histological picture was very similar to that of schistosomiasis. The author could obtain no evidence of schistosomiasis in this part of Africa, though he examined the urine of a series of boys for ova. He goes at length into the treatment he has practised.

[Before a schistosomal origin can be excluded with certainty the complement fixation and intradermal skin tests must be employed.]

A. G. B.

FOSHAY (Lee). **An Antiserum for the Treatment of Tularemia.**—*Jl. Amer. Med. Assoc.* 1933. Nov. 4. Vol. 101. No. 19. pp. 1447–1449. With 3 charts.

The results are given of the use in 69 patients of a serum obtained by inoculating goats with formolized suspensions of *Bact. tularense* and are considered to be favourable. It was not possible, however, to show any antibody action on the specific bacteria nor was it possible to protect laboratory animals against infection even when large amounts of serum were used. The beneficial effect in man is attributed to reduction of inflammatory oedema and stimulation of phagocytosis.

Recommendations for the use of the serum are, early treatment, the use of two intravenous injections of 15 cc. on successive days and serum made from virulent strains of the organism. *W. F. Harvey.*

Brummelkamp (R.). De maagzweer in Nederlandsch-Indië. [**Gastric Ulcer in the Dutch East Indies.**]—*Nederl. Tijdschr. v. Geneesk.* 1933. Nov. 4. Vol. 77. No. 44. pp. 4982–4987. With 25 graphs. English summary (6 lines).

The English conclusions of this paper, which deals with a subject that has been not infrequently discussed lately [*e.g.*, Kouwenaar, this *Bulletin*, Vol. 28, p. 42] are as follows :—

"1. Peptic ulcer of the stomach is rare in the Javanese, notwithstanding the high acidity of their gastric juice.

"2. This high acidity of the Javanese is only of short duration and probably therefore innocuous.

"3. The possibility that a prolonged action of the gastric juice may damage the stomach wall, must be kept open." *A. G. B.*

Rogers (Leonard). **The Methods and Results of forecasting the Incidence of Cholera, Smallpox and Plague in India.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1933. Nov. 30. Vol. 27. No. 3. pp. 217–238. With 4 figs. [17 refs.] [Summary appears also in *Bulletin of Hygiene*.]

The author gives a general account of his previous laborious studies of the relationship between climatic conditions and the three great epidemic diseases of India, and discusses the success with which predictions of incidence have been made in the last three or four years [see *Bulletin of Hygiene*, 1927, Vol. 2, 419 ; 1929, Vol. 4, 117 ; 1931, Vol. 6, 114 *bis* ; 546].

Smallpox epidemics in India as a rule follow very material deficiencies in the monsoon rainfalls and absolute humidities. Forecasts for 1930–32 based upon this rule were more correct than might have been expected in such normal monsoon years, but the extent of the increased incidence in 1933 was, however, somewhat unexpected in view of the 1932 good monsoon and average absolute humidities. This indicates the necessity for further studies with a view to improving future results, and preliminary analysis suggests that saturation deficiency may give better predictions than the absolute humidity hitherto used. This factor also enters into the prediction of plague, a high incidence of which tends to follow low hot weather and monsoon temperatures and low saturation deficiencies of all seasons, and *vice versa*. Forecasts on this basis for the last four years and in different areas have given an appreciable number of correct results and appear to establish their value.

With cholera (apart from the major epidemics in famine years) deficient monsoon rains furnish the most important data in forecasting epidemics, and subsequent low winter and hot weather rains will increase the liability, but abundant winter rains will decrease it. The influence of the variations in the absolute humidity in relation to cholera incidence is just the opposite to that it exerts on smallpox, for it is a low absolute humidity in the winter and early spring months that inhibits or limits the occurrence of cholera. The essential fact is that cholera cannot be widely prevalent over a province unless the absolute humidity is near or over 0·400, and if the rise to or above this point is

delayed by a seasonally low absolute humidity an outbreak of cholera may be delayed or prevented. The most likely explanation appears to be a close correspondence in the dry winter months between absolute humidity and temperature and between low temperature and the viability of the cholera vibrio.

The results obtained with cholera forecasts have been good and it should therefore prove possible to foresee the danger spots and to take steps in good time to mitigate the disastrous epidemics of previous years with short winter rains following low monsoon ones.

A. Bradford Hill.

NORONHA (A. J.). **Further Observations on Rhinosporidiosis.**—*Jl. Trop. Med. & Hyg.* 1933. Dec. 1. Vol. 36. No. 23. pp. 368–370. With 8 figs.

A series of 8 photomicrographs is given in illustration of the statement that liberation of spores by a mature rhinosporidial sporangium may result in localized inflammation and sometimes in miliary abscesses [see this *Bulletin*, Vol. 30, p. 807]. *W. F. Harvey.*

PALES. Les myosites et les pseudomyosites dans le milieu indigène en Afrique Equatoriale Française. [**Myositis and Pseudo Myositis in Natives of French Equatorial Africa.**]—*Ann. de Méd. et de Pharm. Colon.* 1933. Oct.–Nov.–Dec. Vol. 31. No. 4. pp. 512–530. [11 refs.]

This paper follows the arrangement of one on the same subject by HUARD [this *Bulletin*, Vol. 30, p. 49]. In 26 months at Brazzaville the author has seen 35 cases, all in natives. The pathogenic agents in all were staphylococci and pneumococci. In six cases there was no suppuration or very little and puncture was followed by recovery. In 9 cases the causative germ was not isolated but was probably staphylococcus. In 14 cases seeding of the pus gave a staphylococcus, and in 5 cases pneumococcus. Cases illustrating these points are described. Monomyositis was the rule, polymyositis the exception ; in the latter there were 3 cases and 2 deaths. Glycaemia is shown to have no relation to myositis. *A. G. B.*

DE JESUS (P. I.) & DE LEON (W.). **Studies on the Weights of Visceral Organs in Filipinos.**—*Philippine Jl. Sci.* 1933. Oct. Vol. 52. No. 2. pp. 97–98. [10 refs.]

——, —— & ANZURES (P.). **Normal Weights of Visceral Organs in Filipino Children.**—*Ibid.* pp. 99–109. With 1 fig.

DE LEON (W.), GARCIA (Arturo) & DE JESUS (P. I.). **Normal Weights of Visceral Organs in Adult Filipinos.**—*Ibid.* pp. 111–118. [10 refs.]

DE JESUS (P. I.), DE LEON (W.) & RAMOS (J. M.). **Normal Weights of Visceral Organs in Filipinos in Relation to Length and Body Weight.**—*Ibid.* pp. 119–129. With 2 figs.

A series of papers in which the authors report on the weights of the principal visceral organs of normal and pathological cases in relation to age, length of body and body weight in Filipinos. More than 11,000 necropsy records between 1907 and 1924 were studied as well as 1,000 cases from the Department of Legal Medicine. They here deal with the normal weights in childhood and in adults, in relation to age, length and

body weight. A further paper will treat of the weights in pathological conditions. The authors' object is to establish standards for Filipinos. *A. G. B.*

Uhlenhuth (Paul.). Ueber die Entwicklung der Chemotherapie mit besonderer Berücksichtigung der modernen Arsen- und Antimonbehandlung. [**The Development of Chemotherapy with Special Reference to the Modern Use of Arsenic and Antimony.**]—*Deut. Med. Woch.* 1934. Jan. 19. Vol. 60. No. 3. pp. 81–87.

In this address, delivered at the presentation of the Paul Ehrlich Gold Medal, the history of chemotherapy is reviewed from its empirical beginnings in the hands of Paracelsus to its full scientific efflorescence under the guidance of Ehrlich. A true aetiological therapy could only be instituted when the parasitic theory of disease had been firmly established by the work of Pasteur and of Koch. The use of tri- and pentavalent compounds of arsenic and antimony is briefly discussed in relation to the treatment of trypanosomiasis, spirochaetoses, leishmania infections and bilharziasis with special insistence on the intimate relationship of chemical constitution and therapeutic activity. Reference is also made to the new arsenic antimony benzole preparation (386 B) which in Bartonella anaemia of rats gives a chemotherapeutic index of from 1 : 3,500 to 1 : 3,750. The discovery of this compound suggests that a specific cure has been found for Oroya fever and verruga peruviana. *G. M. Findlay.*

Uhlenhuth (P.) & Seiffert (W.). Zur Chemotherapie der Bartonellenanämie der Ratte mit kombinierten Arsen-Antimonpräparaten. [**Treatment of Bartonella Anaemia of the Rat with Arsenic-Antimony Compounds.**]—*Ztschr. f. Immunitätsf. u. Experim. Therap.* 1933. Vol. 80. No. 3/4. pp. 352–356.

Two years ago the authors showed that whereas stibosan in rat anaemia had a therapeutic index of 1 : 8 and salvarsan one of 1 : 80, the index of arsenic-antimony compounds 283 and 246 lay between 1 : 300 and 1 : 500. They have now experimented with a new preparation "As + Sb 386B" and give the protocols. The chemotherapeutic index reached the remarkable figure of 1 : 3,500, *i.e.*, the lethal dose was 75 mgm. per 100 gm. rat and the curative 0·02 mgm. Relapses eventually took place but there may have been reinfections.

A. G. B.

Scrimgeour (H.). **A Fever with Rash of Unknown Origin.**—*Malayan Med. Jl.* 1932. Dec. Vol. 7. No. 4. pp. 137–140.

Cases of dengue-like fever of mild type are common in Malaya but the case reported is unique in the author's experience.

"1. Continued fever for 37 days with fatal termination.

"2. Jaundice occurring on the twentieth day of illness followed by enlargement of the liver.

"3. A severe maculo-papular rash appearing on the third day of illness, becoming purpuric before it fades, recurring with a curious periodicity and followed after the third cycle by desquamation.

"4. Leucopenia with eosinophilia.

"5. No enlargement of the spleen or lymph glands."

Widal, Weil-Felix and Wassermann reactions negative ; no malarial parasites seen. *D. Harvey.*

Dobell (Clifford). **Researches on the Intestinal Protozoa of Monkeys and Man. V. The *Endolimax* of Macaques.**—*Parasitology.* 1933. Dec. Vol. 25. No. 4. pp. 436–467. [30 refs.]

The paper deals in an exhaustive manner with experiments and observations on amoebae of the genus *Endolimax* from certain monkeys. The organisms have been studied in the intestinal contents, have been isolated in cultures and investigated there, while one strain from a *Macacus sinicus* has been passed to man and thence back to a *Macacus rhesus*. To be appreciated, the records given by the author with his customary precision must be studied in detail. They undoubtedly justify his conclusion that the amoebae studied by him from three species of Macacus are identical with *Endolimax nana* of man. One point, however, has not been settled and that is the question of the origin of the amoebae which occur in monkeys which have been in captivity for some time. After capture, during confinement and ultimate transportation overseas many opportunities must occur for susceptible monkeys to contract infections from human beings, and even before capture if they have lived in the vicinity of human habitations. This difficulty was realized by Hegner and Chu (this *Bulletin*, Vol. 28, p. 482) who attempted to solve it by the examination in the Philippine Islands of wild *Macacus philippinensis*. Protozoa morphologically indistinguishable from all the common intestinal protozoa of man were found in one or other of 44 monkeys examined. The authors admit, however, that they cannot exclude the possibility of these protozoa being actually human strains acquired at the same time through the monkeys' association with man. *C. M. Wenyon.*

Becker (Elery R.). **Host-Specificity and Specificity of Animal Parasites.**—*Amer. Jl. Trop. Med.* 1933 Sept. Vol. 13. No. 5. pp. 505–523.

Recent investigations have tended to show that the rigid limitation of a particular parasite to a particular host cannot be accepted as a general rule. It is becoming more and more recognized that a single parasite may have a number of hosts which are not necessarily closely related. A general discussion of the factors controlling this limited host specificity, eleven of which are mentioned, leads to the general conclusion that host specificity becomes interpretable in terms of known physiological phenomena. *C. M. W.*

Brown (H. C.). **Further Observations on the Electric Charge of the Erythrocytes in Certain Protozoal Diseases.**—*Brit. Jl. Experim. Path.* 1933. Dec. Vol. 14. No. 6. pp. 413–421. With 1 fig. [24 refs.]

Continuing his observations on changes in the electric charge of cells, the author has found that in bird malaria, when the infection is being successfully controlled by the protective mechanism of the bird, the negative charge of the red cells is considerably lowered. When, however, the infection is developing steadily there is little or no change. The same thing occurs, but to a less extent, in mice recovering from an infection with *Trypanosoma equiperdum*. It is brought about by the action on the red cells of euglobulin which is increased in these and other infections. The suggestion is made that in malarial therapy of general

paralysis the euglobulin, increased by the malarial infection, may lead to the reduction in charge of the spirochaetes and their consequent phagocytosis. *C. M. W.*

Lwoff (Marguerite). Recherches sur la nutrition des trypanosomides. [**The Nutrition of the Trypanosomidae.**]—*Ann. Inst. Pasteur.* 1933. July. Vol. 51. No. 1. pp. 55–116. [72 refs.]

In this lengthy account of investigations into the food requirements of certain leptomonads as grown in culture media it is shown that they resemble the free living ciliate *Glaucoma piriformis* in that the products of the hydrolysis of proteids are necessary for their growth and multiplication. One of the forms studied (*Strigomonas oncopelti*) like *Glaucoma piriformis* is able to content itself with solutions of peptone. The others, in common with Trypanosomidae in general, require in addition a certain but variable quantity of blood. Tests show that it is iron in an active condition that is required from the blood and in this respect the flagellates tested resemble the haemophilic bacteria. The hypothesis is advanced that the iron is necessary because of a certain deficiency of respiratory ferments. *C. M. W.*

Hogue (M. J.). **A New Variety of** *Retortamonas* (*Embadomonas*) *intestinalis* **from Man.**—*Amer. Jl. Hyg.* 1933. Sept. Vol. 18. No. 2. pp. 433–441. With 16 figs. on 1 plate. [11 refs.]

From a sample of human faeces heavily infected with small flagellates the author cultivated a form of *Retortamonas* (*Embadomonas*) which differed in certain respects from *R.* (*E.*) *intestinalis*. Instead of being unequal the two flagella are of the same length and thickness while the cysts differ as regards the structure of the nucleus. Unlike *R. intestinalis* the flagellate will not grow in ovo-mucoid media, though it thrives in sodium chloride sheep serum water. *C. M. W.*

Thomson (J. Gordon). **The Natural Occurrence of Flagellates of the Subgenus Strigomonas M. and A. Lwoff in the Gut of** *Tabanus africanus* **from Nyasaland and** *Lucilia serricata* **in England.**—*Jl. Trop. Med. & Hyg.* 1933. Dec. 1. Vol. 36. No. 23. pp. 361–365. With 46 figs. on 1 plate.

It was generally supposed that all the leptomona flagellates of insects and plants were structurally identical till Thomson (1930) pointed out that *Herpetomonas culicidarum* of Noguchi and Tilden (1926) differed from the conventional form in having a truncated or depressed anterior end and a peculiar flagellar movement. Cleveland and Collier (1930) noted that the flagellates studied by Noguchi and Tilden differed culturally from the leptomonas of the flea, leishmania and trypanosomes in their ability to grow in blood-free media and suggested they all belonged to one species. Lwoff (1931) working with one of them (*H. oncopelti*) found that in addition to the peculiarity of the anterior end and the flagellar movement it had a striated body surface and decided to place it in a new genus *Strigomonas*. The author of the paper under review has now found flagellates of this genus in the flies mentioned in the title. Furthermore, examination of a number of Noguchi and Tilden's original strains, which he has kept in culture, has shown that they are all Strigomonas. It seems, therefore, that

whatever they may have been originally they now differ from ordinary leptomonads. The suggestion is made that NOGUCHI and TILDEN may have been dealing with mixed infections and that in course of time the Strigomonas, not at first evident, has gradually gained the upper hand in the cultures. Whatever may be the explanation, it is evident that in future observers dealing with insect flagellates will have to differentiate between leptomonads and strigomonads. Many of the previous records may have confused these two forms. *C. M. W.*

i. WOLFF (J. W.). Het voorkomen van Eimeria-Oöcysten in menschelijke ontlasting. [**Eimeria Oocysts in Human Stools.**]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1933. June 20. Vol. 73. No. 13. pp. 813–814. With 1 fig.

ii. KRIJGSMAN (B. J.). Het lot van Eimeria-oöcysten in het darmkanaal van den mensch.—*Ibid.* Aug. 15. No. 17. pp. 1070–1072. [16 refs.]

i. In the stool of a patient sent to the laboratory for examination for amoebic cysts were found fully developed oocysts of a species of *Eimeria* measuring 45 to 50 μ in diameter. The occurrence of the oocysts of fish coccidia (*E. clupearum* and *E. sardinae*) in human faeces is discussed and it is noted that the patient had eaten fish the day before the examination was made.

ii. The author of the second paper notes that the coccidium corresponds with *E. sardinae* (*E. oxyspora*) and points out that the passage of the oocysts through the human intestine is likely to occur only when some intestinal derangement produces a deficiency of the digestive juices which normally destroy the oocysts. Otherwise these oocysts of fish coccidia would be found more frequently in human faeces.

C. M. W.

BOUGHTON (Donald C.). **Diurnal Gametic Periodicity in Avian *Isospora*.**—*Amer. Jl. Hyg.* 1933. July. Vol. 18. No. 1. pp. 161–184. With 4 diagrams. [14 refs.]

Examination of the droppings of English sparrows infected with coccidia of the genus *Isospora* shows that under ordinary daylight conditions oocysts appear in those droppings which are passed during the hours 3 p.m. to 8 p.m. If the light and dark conditions to which the birds are exposed are artificially reversed, after three to five days the time of oocyst appearance changes to 3 a.m. to 8 a.m. This diurnal periodicity, which seems to be correlated with the rest period of the bird, is the first instance to be recorded of periodicity for the sexual phase of a sporozoon. *C. M. W.*

COATNEY (G. Robert). **Relapse and Associated Phenomena in the Haemoproteus Infection of the Pigeon.**—*Amer. Jl. Hyg.* 1933. July. Vol. 18. No. 1. pp. 133–160. With 7 figs. [20 refs.]

The young forms of *Haemoproteus columbae* first appear in the blood of pigeons 28 to 30 days after exposure to the bites of infected flies (*Pseudolynchia maura*). The parasites in the blood increase steadily in number (acute phase) and then decline (crisis) till only a few remain (chronic phase). They may apparently disappear entirely from the blood (latent phase). The latent phase does not always follow the chronic phase as relapse may occur before this stage is reached. If

relapse does not occur during the chronic phase it does so after the latent phase has lasted a few days. After relapse the same phases occur as in the primary attack but the infections are less intense. The relapses occur very irregularly and have nothing to do with any parasite periodicity. If a bird recovers entirely from infection, as it may, it is susceptible to reinfection. Birds differ from one another considerably as regards the intensity of infections produced. In one with one-third of the red cells infected the parasites appeared to be pathogenic. It was not possible to provoke relapse by artificial means. In one instance infection was transferred to a healthy pigeon by injection of lung tissue. It was not possible to infect mourning doves (*Zenaidura macroura carolinensis*) with the pigeon parasite though the bird is a favourable host for the fly. *C. M. W.*

MELENEY (Henry E.). **The Relative Incidence of Intestinal Parasites in Hospital Patients in Nashville and in Rural Tennessee.**—*Jl. Lab. & Clin. Med.* 1933. Nov. Vol. 19. No. 2. pp. 113–119.

This report is a summary of the routine faecal examinations made in the Department of Preventive Medicine of the Vanderbilt Medical School, Tennessee, between January 1930 and June 1932. Of the 2,112 whites and negroes examined 1,231 were adult medical outpatients. The results give the incidence of parasites from the combined urban and rural population of middle Tennessee.

The technique comprised, a heavy smear in saline for Strongyloides larvae and helminth eggs, a thin smear in saline for motile protozoa, a salt-floatation for helminth eggs, emulsification and centrifugation with subsequent addition of iodine eosin for protozoan cysts, and in some instances staining of smears with iron haematoxylin. There was one faecal examination per person. Table I (abridged) gives the results.

Summary of Faecal Examinations on 2,112 Patients in Vanderbilt Hospital, January 1, 1930 to June 30, 1932.

	Total	
	No. pos.	Per cent. pos.
One or more parasites	642	30·4
Endamoeba histolytica	63	3·0
Endamoeba coli	269	12·7
Endolimax nana	153	7·3
Iodamoeba bütschlii	68	3·2
Giardia lamblia	115	5·5
Chilomastix mesnili	73	3·5
Trichomonas hominis	35	1·7
Enteromonas hominis	6	0·3
Ascaris lumbricoides	53	2·5
Trichuris trichura	22	1·0
Hookworm	24	1·1
Hymenolepis nana	24	1·1
Strongyloides stercoralis	14	0·7
Enterobius vermicularis	3	0·14

Of the *E. histolytica* persons only two had dysentery, and in 57 cysts only were found. The frequency of Strongyloides shows that this

parasite is of some importance in Tennessee. Another table compares the results of the Nashville protozoal examinations with those from Chicago, Baltimore and New Orleans. In this Baltimore has the lowest incidence, then Chicago, then Nashville and New Orleans highest [see this *Bulletin*, Vol. 26, p. 870 and Vol. 28, pp. 784 and 785]; as one would expect the incidence is progressively higher from north to south.

Table 3 compares the incidence at the Vanderbilt Hospital, Nashville, with that of the rural population both near and far.

Incidence of Human Intestinal Parasites in Vanderbilt Hospital Patients and in the Rural Population of Tennessee.

	Protozoa						Helminths			
	E. histolytica	*E. coli*	*E. nana*	Iodamoeba	Giardia	Chilomastix	Ascaris	Trichuris	Hookworm	*Hymenolepis nana*
Vanderbilt Hospital ...	3·0	12·7	7·3	3·2	5·5	3·5	2·5	1·0	1·1	1·1
Rural population of eight surrounding counties	9·5	32·0	13·3	4·3	15·0	3·5	16·7	2·5	0·2	1·8
Rural Tennessee as a whole	11·4	32·1	11·9	4·1	14·7	2·9	27·1	7·6	6·8	2·9

It is seen that the incidence of almost every parasite is higher in the rural area than in the Vanderbilt hospital, which is partly explained by the rural survey having been mainly among children. Not so, however, for amoebiasis, which is known to be heaviest among adults, and here the explanation probably is that hygiene is better in the city. The author notes the dictum of CRAIG that "the great source of infection in this country [U.S.A.] is the foodhandler in public eating places." The author's figures indicate on the other hand that the conditions for transmission of the dysentery amoeba are much more favourable in the rural districts than in the cities. *A. G. B.*

PIROT (R.) & LE MOULT. Parasitisme intestinal chez les soldats indigènes de race noire en garnison à Toulon. [**Intestinal Parasitism in Senegalese garrisoned at Toulon.**]—*Bull. Soc. Path. Exot.* 1933. Nov. 8. Vol. 26. No. 9. pp. 1162–1166.

In 1932 Pirot studied the intestinal parasites of Europeans of Toulon [this *Bulletin*, Vol. 29, p. 404]. This paper concerns the parasites of 100 Senegalese stationed at Toulon who were admitted to hospital for various causes. More than 300 examinations were made.

The table gives the findings (to which those of the former paper have been added); 90 were parasitized; parasites totalled 175.

Helminths.—All but 17 had ankylostome eggs. Concerning the 17 the authors say that after five years in France the native only exceptionally harbours ankylostomes. Though they persist in the European the native seems to clear himself unless he is submitted to successive

reinfestations. Similarly with Ascaris and Trichocephalus the infestation of the native tends to fall and to approach that of his white neighbours. This is not the case with Strongyloides, Taenia, and Schistosoma, met with only exceptionally in the Toulonese. It is usually taught that Taenia eggs are never found in the stools. In 11 instances here the diagnosis was made on microscopic examination, not on the passage of segments and the eggs were found spread throughout the faeces ; in every case the tape worm was unarmed.

The finding of Schistosoma requires patience and repeated examinations ; the authors think that the figure of 13 per cent. is probably less than the truth. *S. mansoni* causes in the black man severe intestinal symptoms with profuse and alarming haemorrhage, in one case fatal ; the passage of ova is irregularly cyclical. In old cases search for eggs may be always negative in spite of rectoscopic examination and rectal prolapse. Relapses are frequent. Emetine is useless but antimonial salts are rapidly effective. There is no tendency to recovery in temperate climates.

Protozoa.—With the exception of *Endolimax nana* protozoal infections were less numerous than among the Toulonese.

	Senegalese Per cent.	Toulonese Per cent.
1. Helminths :—		
Trichocephalus eggs	20	13·6
Ascaris eggs	9	2·8
Strongyloides larvae	4	—
Ankylostome eggs	83	0·4
Taenia saginata embryophores ...	13	0·6
Schistosoma mansoni eggs	13	—
2. Protozoa :—		
Entamoeba histolytica cysts	4	6·4*
Endolimax nana cysts	5	0·4
Entamoeba coli cysts	23	9·2
Giardia intestinalis cysts	1	3·8

* And 2·2 vegetative.

A. G. B.

Hecht (Otto). Die Blutnahrung, die Erzeugung der Eier und die Ueberwinterung der Stechmückenweibchen. [**Blood Feeding, Production of Eggs and Hibernation in Female Mosquitoes.**]—*Beihefte z. Arch. f. Schiffs- u. Trop.-Hyg.* 1933. Vol. 37. No. 3. pp. 129–211 (5–87). With 1 fig. [6 pages of refs.]

In this lengthy paper, the scope of which is sufficiently indicated by its title, the author provides an admirable résumé, accompanied by discussion, of the chief published results of the modern experimental method of studying mosquito bionomics.

While much space is naturally devoted to the ordinary European laboratory mosquitoes, *Anopheles maculipennis* and *Culex pipiens*, the behaviour of *Theobaldia annulata*, *Aëdes aegypti*, and the anophelines of North and South America, the Punjab and Southern Rhodesia is also under review.

As regards hibernation, after summarizing the statements of other authors with reference to *C. pipiens*, Hecht concludes that in this species the phenomenon is merely a result of low temperature ; whereas in *A. maculipennis* it is a normal part of the life-cycle largely independent of temperature, although the actual cause is as yet unknown. Hecht thus rejects ROUBAUD'S theory of auto-intoxication (due to overloaded Malpighian tubules) as the explanation of the diapause exhibited by overwintering females of *A. maculipennis*.

To all concerned with the problems presented by mosquito bionomy this able conspectus will be of material assistance, and the announcement in the foreword that the author finds himself compelled to sever his connection with medical entomology will be received with general regret. *E. E. Austen.*

SIMMONDS (H. W.). **The House-Fly Problem in Fiji.**—*Fiji Ann. Med. & Health Rep. for Year 1932.* pp. 46–53.

The narrow-fronted house-fly, called by PATTON *Musca vicina*, if less common nowadays in parts of the Fiji Islands, is abundant and troublesome in the Rewa Valley and elsewhere, including at certain seasons particular areas of Suva itself. Contrary to the habit of *M. domestica* in the British Islands, the insect breeds normally in cow-dung, its eggs being laid in depressions in the crust on droppings from 4 to possibly 24 hours old, lying in the sun ; a single dropping may subsequently contain 2,000 larvae. It also breeds in human faeces, stable manure and the city refuse dump in Suva, and it is noteworthy that the routine practice of burning the last-added layer of the dump does not destroy the contained maggots. The notoriously filthy habits of the common house-fly are faithfully reproduced in Fiji. While in restricted areas the pest might be controlled by *spreading* cow-dung at least twice a week, so as to ensure rapid desiccation, the author considers that large-scale natural control would perhaps be secured by enlisting the aid of dung-burying beetles (as at present being tried in Hawaii for the control of the horn-fly, *Lyperosia irritans*), which presumably would have to be introduced *en masse* for the purpose. *E. E. A.*

i. D'UBY (P. Dupuy). A propos d'un nouveau cas de myiase oculaire à *Oestrus ovis* observé à Alger. [**A New Case of Ocular Myiasis caused by** *Oestrus ovis*, **observed at Algiers.**]—*Arch. Inst. Pasteur d'Algérie.* 1931. Dec. Vol. 9. No. 4. pp. 630–637. With 2 figs. [10 refs.]

ii. TRABUT (G.). Un cas de myiase oculaire à *Oestrus ovis* à Alger. —*Ibid.* p. 638.

Many years ago the brothers SERGENT drew attention to a form of myiasis chiefly affecting the conjunctiva, due to larvae of the sheep bot-fly (*Oe. ovis*), of fairly frequent occurrence in Algeria, and known among the Kabyles and Touaregs respectively as *Thim'ni* and *Tamné*. The insect while on the wing deposits its living larvae in the eyes or nostrils, or on the lips. It would seem probable that the fly's attacks upon man generally happen when sheep are few, and the human population is fairly dense.

The victims in the cases recorded in the papers under review were two natives and a European, who each experienced the usual sensations

produced by the sudden intrusion of a foreign body into the eye. The larvae—seven or eight in number in one instance—were all in the first instar and were removed with little difficulty, whereupon the inflammatory symptoms in the patients' eyes readily yielded to simple treatment. *E. E. A.*

Cushing (Emory C.) & Patton (W. S.). **Studies on the Higher Diptera of Medical and Veterinary Importance. *Cochliomyia americana* sp. nov., the Screw-Worm Fly of the New World.**—*Ann. Trop. Med. & Parasit.* 1933. Dec. 20. Vol. 27. No. 4. pp. 539–551. With 7 figs.

The notorious myiasis-producer hitherto known as *Cochliomyia* (*Chrysomyia*) *macellaria* would seem to have been wrongly identified. By examination of the male terminalia, a series of blow-flies trapped in Texas proved to be specifically distinct from a second series of deceptively similar flies bred at the same time and place from larvae in wounds in cattle. The members of the former group were true *C. macellaria*, which the authors therefore conclude is either harmless, or at most " a very doubtful myiasis-producing fly." In the belief that the species represented by the flies from the cattle, which is doubtless the real cause of nasopharyngeal and other forms of myiasis in man and animals in the Americas, is as yet undescribed, the authors characterize it under the name given above.

[Assuming that the " *Musca* " *macellaria* of Fabricius has now been correctly interpreted, it would seem probable that this species is not a cause of myiasis, and that the designation " Screw-worm Fly " has been applied to it in error. On the other hand it has been suggested by Collin (in a verbal communication to the present reviewer), with evident truth, that the supposedly new species is identical with " *Lucilia* " *hominivorax*, which was described by Coquerel so long ago as 1858. Should no other name be proved to possess priority, the American producer of myiasis must therefore be known henceforth as *Cochliomyia hominivorax*, Coq.] *E. E. A.*

Lefrou (G.). A propos de la répartition géographique du Ver du Cayor. [**Geographical Distribution of Ver du Cayor.**]—*Bull. Soc. Path. Exot.* 1933. Oct. 11. Vol. 26. No. 8. pp. 1098–1099.

A record of this wide spread " tumbu " fly from the forest region of Mayoumbe between Loango and Brazzaville ; the larvae were found in labourers on the Congo-Ocean railway, whether *Cordylobia anthropophaga* or *rodhaini* is unknown. The author says that the fly is now rare in Cayor, Senegambia, probably owing to deforestation. *A. G. B.*

Sassuchin (D.). **Summary of Works on Tick Investigations in the South-East of U.S.S.R.**—*Rev. Microbiol., Epidémiol. et Parasit.* 1933. Vol. 12. No. 1. pp. 31–44. With 2 plates & 3 figs. [In Russian. English summary pp. 45–46.]

A description of the ticks found in the Lower Volga Region and Western Kazakstan, with an account of their bionomics, distribution, and rôle in the propagation of disease in man and domestic animals.

C. A. Hoare.

* Kopstein (Felix). Die Gifttiere Javas und ihre Bedeutung für den Menschen. [**The Poisonous Animals of Java, and their Significance for Mankind.**]—*Meded. Dienst d. Volksgezondheid in Nederl.-Indië.* 1932. Vol. 21. No. 4. pp. 222–256. [Refs. in footnotes.]

Kopstein, in this article dealing with the poisonous arthropods, fish and snakes of Java, reports that bathers and fishermen are often stung by Medusae. Interesting cases are cited including that of a girl in Batavia, in whom local necrosis of the skin and tendons of the hand followed contact with a jelly fish, and another of a boy in the Philippines who died 3½ hours after being similarly stung.

Cantharidin poisoning by Epicauta beetles also occurs. One person, who ate ten roasted *Epicauta ruficeps*, died shortly after with severe gastro-intestinal symptoms including salivation, vomiting, diarrhoea and tenesmus. Dried beetles averaged 0·1 grams and contained about 10 per cent. of cantharidin. Verbeek observed that when *Epicauta ruficeps* was disturbed it discharged fluid which contained cantharidin from the mouth and joints of the legs. Skin contact produced blisters lasting 3 days. Brug reported a fatal case after eating specimens of *Mylabris pustulata* (=*M. kolleri*), another beetle containing cantharidin.

Scorpions are also numerous, but though their sting causes much pain and swelling, no fatal results have been recorded.

Certain species of globe fish (Tetraodontidae), which are eaten only by poor people, are poisonous, but the flesh itself is harmless once the sexual organs (ovaries) have been removed.

Venomous fish mostly belong to the Siluridae and Acanthopterygii. *Synanceia verrucosa* is much dreaded : it lies concealed in sand and punctures the skin by means of rays on the dorsal fin : gastro-intestinal symptoms, pain, swelling, lymphangitis and local gangrene ensue : death with tetanic convulsions may occur ; none have been recorded from the Dutch East Indies, but several non-fatal cases have occurred in Amboina and Ladrone. Of the Siluridae two species are well known. *Clarias batrachus* punctures with the first rays of the pectoral barbed fin which is connected with a poison gland ; it produces local inflammation leading to necrosis or gangrene. *Plotosus canius* possesses a poison spine on both the pectoral and dorsal fin and produces painful lesions ; both these fish are commonly eaten in Java.

Kopstein's remarks on the poisonous Javanese snakes were reviewed in No. 2 of the Bulletin (p. 99). *N. Hamilton Fairley.*

Giamarchi (P.) & Sautet (J.). Contribution à l'étude des accidents dus à la piqure des araignées en Corse. [**Symptoms of Spider Bite in Corsica.**]—*Rev. Méd. et Hyg. Trop.* 1933. Sept.-Oct. Vol. 25. No. 5. pp. 257–260.

The venomous spiders of Corsica are *Latrodectus tredecimguttatus*, Rossi, two species of *Lycosia* and *Ctenizia sauvagei* Rossi. Latrodectus, a black spider with bright red spots, is the most feared. Three cases are here described, one at some length. The symptoms are paralysis and violent pain in every case, profuse sweating very common, obstinate erection and anuria very common, late eruption common ;

* Summarized from a translation by Colonel H. J. Walton.

the last consists of a general invasion of red lenticular spots, non-confluent and not disappearing on pressure. The treatment, described, is symptomatic. The peasants put the victim into a hot oven.

A. G. B.

SERGENT (Et.) & SERGENT (A.). Pouvoir immunisant du venin d'abeille contre le venin de scorpion. [**Immunizing Power of Bee Venom against Scorpion Venom.**]—*Arch. Inst. Pasteur d'Algérie.* 1933. Dec. Vol. 11. No. 4. pp. 588–597.

The authors made numerous experiments to see whether the venom of Algerian bees (*Apis mellifica*) immunized mice and guineapigs against scorpion venom (*Buthus occitanus*).

They found that the stings of bees, or the subcutaneous injection of macerated stings, gave to 12 out of 20 mice a slight immunity to scorpion venom injected under the skin. In these instances death was delayed some hours or some days; 33 controls died in two hours. Bee venom did not protect 12 guineapigs against scorpion venom.

A. G. B.

ACTON (H. W.). A Cause of Damage to Optical Glass in the Tropics.—*Indian Med. Gaz.* 1933. Dec. Vol. 68. No. 12. pp. 688–689.

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Radsma (W.), Streef (G. M.) & Klerks (J. V.). Over het zuur-base evenwicht bij tropenbewoners. (4de mededeeling.)—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1933. Dec. 19. Vol. 73. No. 26. pp. 1651–1659.

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Wokes (Frank). The Effect of Calcium Administration on the Toxicity of Carbon Tetrachloride in Mice.—*Quarterly Jl. Pharm. & Pharmacol.* 1933. July–Sept. Vol. 6. No. 3. pp. 413–417. With 1 fig.

REVIEWS AND NOTICES.

CALKINS (Gary N.) [Ph.D., Sc.D., Professor of Protozoölogy, Columbia University]. **The Biology of the Protozoa.** Second Edition, thoroughly revised.—pp. xi+607. With 223 engravings & 2 coloured plates. 1933. London: Baillière, Tindall & Cox: 8 Henrietta Street, Covent Garden, W.C.1. [37s. 6d.]

The first edition of this book was published in 1926 and in it the author informed his readers that he had brought together conclusions founded on 30 years of research on the Protozoa and on an equal number of years of teaching protozoology at Columbia University and at the Marine Biological Laboratory at Woods Hole. Now, seven years later, he presents the second edition of this work which is, as he says, not a complete account of the Protozoa but rather a study in biology illustrated by unicellular animals. The author's researches during all these years have been concerned very largely with free-living protozoa and more particularly with the fundamental problems of organization, development and reproduction rather than with the details of structure and morphology which have made appeal to those more systematically inclined. His investigations on the phenomena accompanying fertilization and those on vitality in relation to youth, age and maturity, and the effects upon this vitality of conjugation and endomixis are well known. Protozoologists were grateful to the author for his first edition and they will be still further in his debt for the second, which introduces much new work and offers the reader, as no other book does, a clear account of what may perhaps best be described as the philosophical aspects of protozoology.

Though the sections of the book devoted to the foregoing subjects, upon which the author is a recognized authority, constitute its most interesting part, systematics are not entirely neglected, for at the end (in the earlier edition in the middle) are four chapters dealing with the special morphology and taxonomy of the four main subdivisions of the Protozoa, in which are included somewhat elaborate keys to the various genera. These keys will be of use, as they were in the first edition, to those who wish to determine the genus of any protozoon they happen to encounter. As already noted, the author's work has been chiefly with free-living protozoa and it is perhaps not surprising that when dealing with parasitic forms and the diseases they produce certain errors have crept in, especially in the chapter on ecology, commensalism and parasitism. It is not clear, for instance, what is meant by *Entamoeba intestinalis* (p. 51); *Lankesteria* is not a haemosporidian (p. 70); what is *Giardia augusta* (p. 115)? There is no such disease as infantile ulcer (p. 369), each sporoblast of coccidia of the genus *Isospora* gives rise to 4, not 2, sporozoites (p. 405), Ross (1907) did not work in Paris (p. 407). *Plasmodium malariae* is not the largest of the malarial parasites of man (p. 408), the organism figured at *B* and *C*, Fig. 218 (p. 545) is certainly not *Lankesterella ranarum*, the statement that only in rare cases are organs apart from the digestive tract infected with the dysentery amoeba requires qualification by mention of the fairly common liver abscess (p. 396), *Entamoeba ratti* is surely not a parasite of the rabbit, nor is *E. cobayae* Walker (*E. caviae* Chatton) an amoeba of swine (p. 387).

Enough has perhaps been said to indicate the scope of the book, which will be very useful to those who wish to have a general survey of

the biology of the protozoa, but less so to those who wish to obtain detailed information regarding parasitic forms. On the whole the book will be of greater use to zoologists and biologists than to medical men.

C. M. Wenyon.

LANGERON (M.). **Précis de microscopie. Technique—Expérimentation —Diagnostic.** [Manual of Microscopy.] 5th Edition. Entirely Revised.—pp. xx+1205. With 365 text figs. 1934. Paris: Masson et Cie. 120 Boulevard Saint-Germain. [100 fr.]

The third edition of this book, which appeared in 1921 and was reviewed in this *Bulletin*, Vol. 19, p. 266, was followed in 1925 by the fourth edition and now this year by the fifth. This sequence of events speaks for itself and indicates a continuous demand and, what is more important, a recognition of its practical utility. What was said of the third edition in the review referred to above is equally applicable to the two succeeding editions. The book is unique and, coming from a laboratory where bacteriology, mycology, pathology and general parasitology are studied, and written by one who is himself not only a recognized authority on and teacher of these subjects but also an investigator in many branches of biology, it covers a very wide field in a way no other author has attempted. Broadly speaking it deals in a highly practical manner with many aspects of general microscopy, the methods of examination, fixation, embedding, cutting, staining and mounting of tissues and parasites, the technique of vital staining and observations on living organisms, and the special methods which have to be adopted for the study of protozoa, helminths, arthropods and fungi, including the procedures necessary for their cultivation and breeding. The invertebrate transmitters of vertebrate parasites are specially considered, the methods of maintaining them for experimental purposes being carefully described. As regards bacteria, these are dealt with only in so far as direct observation on infected material allows. The elaborate methods of culture employed in bacteriology are left for the books specially devoted to this subject.

Compared with the fourth edition the present one is longer by nearly two hundred pages. Many of the sections have been entirely rewritten and there has been introduced much new matter covering micro-spectroscopy, microincineration, microphotography by infra red rays, technique for examining objects by reflected light, vital staining and metallic impregnation of tissues, determination of pH by colorimetric methods and many other subjects not considered in the last edition. The illustrations are, as usual, excellent, while nearly fifty appear for the first time. Enough has perhaps been said to indicate the scope of this highly practical manual, which should find a place in every laboratory where parasitology is studied. Those who are familiar with BRUMPT'S Précis de Parasitologie will perhaps realize that this Précis de Microscopie, coming from the same laboratory, is a sister book to it and embodies all the technical methods which are necessary for the study of the parasites Brumpt's book describes. *C. M. Wenyon.*

Printed under the authority of HIS MAJESTY'S STATIONERY OFFICE
by the South Essex Recorders, Ltd., High Road, Ilford.

(194) Wt. P3/124 1875 5/34 S.E.R. Ltd. Gp. 353.